The Builder.

VOL. XC.—No. 3294. MARCH 24, 1906.

ILLUSTRATIONS.

Palazzo Avignonesi, Montepulciano.....Drawn by Mr. Lionel U. Grace.
Blebo House, Fifeshire (Two Views).....Mr. James Findlay, Architect.
Hackney Central Library Competition: Selected Design.....By Mr. H. A. Crouch, A.R.I.B.A.
Buildings in Christchurch, New Zealand.....From Photographs.

Illustrations in Text.

Notes in New Zealand, II.:—
Fig. 1. Canterbury College and Museum, Christchurch, N.Z..... Page 308
Fig. 2. Sketch Plan of Catholic Cathedral, Christchurch, N.Z..... Page 309
Fig. 3. Sketch Plan of Cottage near Christchurch ..... Page 310
Monument to the late Mr. John Leaning, in Norwood Cemetery. Mr. H. P. Burke Downing, Architect ..... Page 316
Blebo House, Fifeshire. Plan ..... Page 322
Design for Hackney Central Library. Section Page 323

CONTENTS.

	PAGE
Notes in New Zealand.—II.	307
Notes	310
The Royal Institute of British Architects	313
British School at Rome	315
The Further Strand Improvement Scheme	315
Monument to the late Mr. Leaning	316
Carpenters' Hall Lectures	317
Vestiges of Bermondsey Abbey	319
The Architectural Association Discussion Section	319
The London County Council	320
Applications under the 1894 Building Act	321
Fifty Years Ago	322
Illustrations:—	
Palazzo Avignonesi, Montepulciano	322
Blebo House, Fifeshire	322
Hackney Library	323
Buildings in Christchurch, New Zealand	323
Architectural Societies	323
Books—P. Macquoid's "A History of English Furniture"; H. Adams's "Cassell's Building Construction"; "Proceedings of the Incorporated Association of Municipal and County Engineers, Vol XXXI."; A. Shadwell's "Industrial Efficiency: A Comparative Study of Industrial Life in England, Germany, and America"	323
Books Received	324
Correspondence:—	
Ferro-Concrete	324
Pulpits at Ravello	324
The Student's Column	324
Metropolitan Asylums Board	326
Court of Common Council	326
Obituary	326
General Building News	326
Stained Glass and Decoration	327
Appointments	327
Sanitary and Engineering News	327
Foreign	327
Miscellaneous	328
Capital and Labour	329
Legal:—	
Munificent Bequest for the Erection of Model Dwellings	329
Action by Builder on Architect's Certificate	330
Bursting of a Water Main in Piccadilly-circus	330
The Composition of Mortar	330
Patents	330
Some Recent Sales	331
Meetings	332
Prices Current	332
Tenders	333
List of Contracts, etc.	334

Notes in New Zealand.—II.

FROM Dunedin to Christchurch, if the weather be fair, is an easy one-night trip by the good coasting steamers which ply all round New Zealand. The harbour of Christchurch is Port Lyttleton, a landlocked bay of considerable extent, surrounded by treeless steeply sloping hills. In a hollow of one of these is the small town of Lyttleton, its houses perched picturesquely on the steep hillside. Below, on the only level ground, are the railway yards, from which the wharves jut out into the water. The train almost immediately enters a long tunnel, and when it regains the light of day the suburbs of Christchurch commence. The contrast to Dunedin is striking. As far as the eye can reach not a single break in the level plain is visible, except occasional houses and trees, till in the far distance a faint outline of white and grey is detected. At first the stranger thinks them clouds, but on close observation they are seen to be snow-capped mountains, a spur of the fine main range of the country. Between is a great expanse of some of the richest agricultural country in the world, the celebrated Canterbury Plains. Seven or eight miles from Lyttleton, Christchurch is reached, the station being at the southern end of the city, and the first impression is one of disappointment. Commonplace buildings surround the railway, and there is nothing to catch the eye or excite the imagination. Even the few domes and towers that exist seem lost. Hence when one gets to know the city and its surroundings their charm is all the greater.

As Dunedin was founded by Presbyterian Scotchmen, so Christchurch was settled by Established Church Englishmen, and the influence is marked even to the present day. The ecclesiastical tone permeates its fine educational buildings, University schools and museums, its Law Courts, municipal offices, and even affects many of the private dwellings of the well-to-do. But there it ends. In the business quarters modernity is paramount, though even so there is a faint recollection of some of the more up-to-date of the country towns of the midlands. The chief discordant note in the English symphony is the newly-completed Catholic Cathedral (see lithograph plate), which in size quite dwarfs its earlier Anglican brother, but of these more anon. It is a sign of the mixture of races and of the presence of the genial and irrepressible but devout Irishman.

The city proper is nearly a mile and a quarter square, surrounded on the north-east and south by wide avenues called the Town Belt, and on the west is bounded by the fine public domain of Hagley Park. The city's centre is a large open space, a Greek cross in plan, and the rest of the area is sub-divided by wide straight streets into rectangles, relieved by the pretty little winding river Avon, which meanders through its heart from south-west to north-east, and bisected by a tram-line and main street, which traverse the city diagonally from south-east to north-west. The Avon is the chief jewel in the Crown of Christchurch, for its waters are clear and uncontaminated, and its banks are formed into charming public gardens bright with the greenest of grass and the gayest of flowers, and backed up by some of the more important public buildings. Many of the streets are also planted with trees, notably the Belts, and the northern end of Antigua-street, with its fine avenue of elms; but even more might be done in this direction with advantage.

The Anglican Cathedral (see plate) occupies, as is natural under the circumstances, the finest site in the city, viz., one half the central square, and is thus well open to view on all sides, and forms, in addition, the terminal point of the vista of the chief cross street from east and west. To English eyes it merely gives the idea of a large parish church, but if it is remembered how small was the population when it was projected, then the faith and liberality of its founders are deserving of the most sincere respect. They meant to do their best and to get the best, and so commissioned the late Sir Gilbert Scott to prepare the design, which is of the usual cruciform type, with north and south porches. From the large piers at the crossing it is evident that Scott intended a central tower, which would have had a much finer effect than the almost detached tower and spire at the north-west angle now existing. The lower part of the

Fig. 1. *Canterbury College and Museum, Christchurch, N.Z.*

spire is of stone, but two-thirds of the way up the colour abruptly darkens, and one learns on inquiry that the rest is in metal. Earthquakes even in the South Island of New Zealand are not infrequent, and twice has the top of the spire been shaken down—hence the present makeshift. To the same ever-present danger the abandonment of the central tower is no doubt attributable; but it is much to be regretted that, though this could not have been safely erected, yet the alternative of a timber-framed and metal-covered central lantern was not adopted. It would have suited the site far better than a detached tower out of centre with everything. It is, however, a fine church of its kind, and the interior is impressive, but it is easy to see that the somewhat ornate western narthex is by another hand, as also the transepts and the apsidal choir. The former may have been designed by Scott but detailed locally; the latter look as if they were wholly of local origin, as the scale of the windows and features is not in harmony with the rest of the building, being too coarse and bald. Internally, also, the apse is bare compared with the nave, and the aisles to the latter are disfigured by a garish-coloured glazed tile dado that is quite out of harmony with the stone walls and undecorated timber roof.

Flanking the Cathedral on the right and left are Dalgety's florid Renaissance stone-faced office building and Warren's quieter but cement-coated hotel. Adjoining the latter is one front of the Lyttleton *Times* office, a vigorous modern design of free Renaissance type, with a ground story of grey stone and an upper one of white stone and red brick. The arched ground floor and pier treatment above, with an emphasised centre, are decidedly sensible and satisfactory. Another pleasing but low square one-story building is the Bank of New Zealand on the south side of the square. It is of much older date, a quiet correct classic design, with four Corinthian attached columns and entablature marking the centre of each face, and its reticence serves as an excellent reminder that an excess of strenuousness is no more pleasing in buildings than in people. At the south-west corner of the square a large block of business premises in course of erection give promise of being effective, but they look as if built primarily for revenue. The large semi-arches of the second-story suggest the idea of a hall at that level. Except the Australian Mutual Provident Society's office, there are no other buildings in the square of any architectural merit, but when the time comes to pull them down their sites will offer very fine opportunities to the architects of the city: may they have the skill to use them right worthily. In that case Christchurch will possess a city centre that the inhabitants of many older and larger cities might envy. In the open spaces, besides ample roadways, there are at present only one fountain and basin, one statue, and some flowers and grass. What an opportunity exists to turn this fine area into an architectural and botanic triumph, if the city fathers could only be inoculated with the idea that colonnades, shelters, fountains and statues, trees, shrubs, and flowers should be co-ordinated in one complete conception worthy of the future of this prosperous town. But the trams would have to be taken severely in hand, and the traffic so arranged that it would pass around and through the square, and not turn it into the mere tram shunting-yard it bids fair to become.

In strolling around the business streets near the Cathedral-square some very fair specimens of architecture may be noted. One of the most recent is the office of the Christchurch Meat Company, a two-story building in brick and stone, with a large cove finely carved with a ship *motif* and a richly-foliated frieze. The central bay gives piquancy to the otherwise flat front. The New Zealand Loan and Mercantile Agency Company's three-story stone building, in round arched Gothic *à la* Waterhouse, belongs to an earlier period, but is good of its kind, as are also the temporary premises of the National Bank, a Renaissance design with a Doric porch and Ionic order above. The new permanent premises for the same institution are, however, a sad contrast, the exterior showing a commonplace two-story treatment, and inside one-story the full height. Another new bank building is that for the Bank of Australasia (see plate), which is an attempt at being up-to-date, in the later English Renaissance, but is much too ornate to be wholly satisfactory. Amongst the warehouses, that of Messrs. Sargood, Son, & Ewen is noticeable for its deeply-recessed windows and generally good warehouse character, but the very wide ground floor openings make the entrance in contrast look pinched, and the centre gable is too sharply pitched to quite harmonise with the other lines of the front. Shop architecture shows very little that is out of the common, but Ballantyne & Cosgrove's may be noted as evidencing more thought than usual in connexion with the treatment of large surfaces of glass, one of the most difficult problems an architect has to solve. Not far away, in a small triangular space left at the junction of the diagonal street with one of the gridiron series, there is a small clock-tower, which at once arrests the attention of an Englishman. The upper part is of sheet and wrought iron, and very well designed in the prevalent Gothic of thirty or forty years ago. The lower part is of very ordinary design in stone, and is provided with a drinking fountain. The story goes that [illegible] of

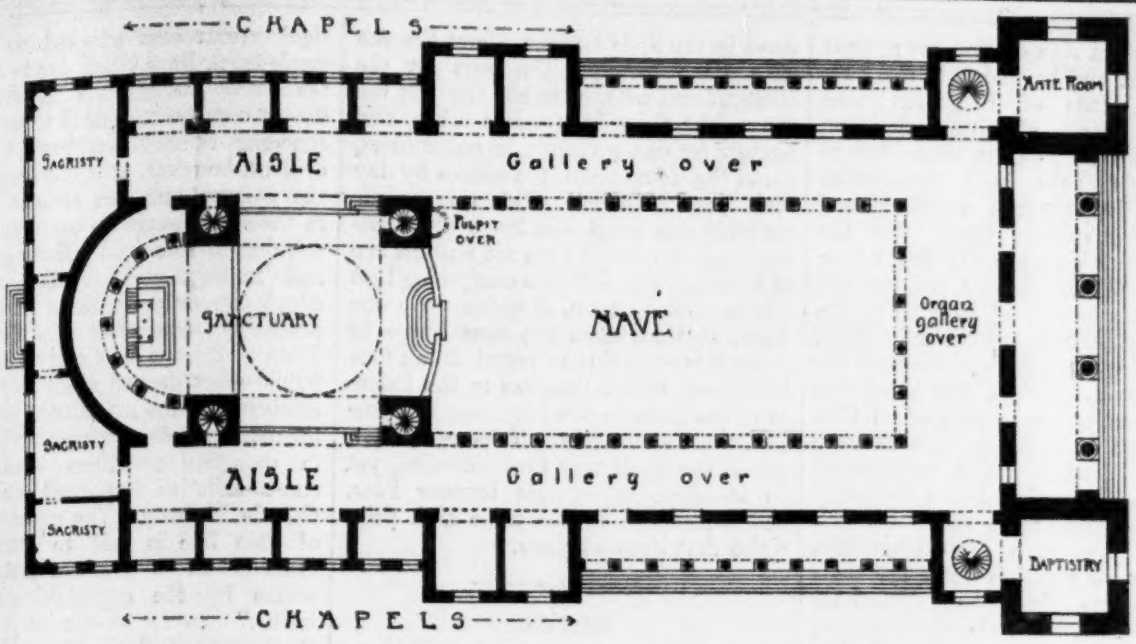


Fig. 2. Sketch Plan of Catholic Cathedral, Christchurch, N.Z.

the Premiers purchased the upper part *en bloc* second-hand, and the Borough Engineer erected the stone lower story. If not true the story is, at any rate, *ben trovato*, and one feels it ought to be true, to explain the anachronism. Going eastward from the business quarter in search of the Canterbury Hall one passes a small new hotel (the "Provincial"), in red brick and white stone, which is noticeable for its quiet, sensible, and almost plain treatment of red brick and white stone in the Free Renaissance manner—a very pleasant exception to the usually too pronounced efforts of hotel architects. The Canterbury Hall, again (see plate), is in the same materials, but shows more effort, and the twin towers, twin pedimented projections, and small central feature, to say nothing of the balconies, are somewhat disturbing. But, on the whole, it is better than many another building of the same class, and, as the result of a competition, is not to be too severely criticised, for "the man in the street," even in Christchurch, still likes a good deal of show for his money.

This failing is also the dominant note in the large new Roman Catholic Cathedral just completed, which is nevertheless the most important building in Christchurch, so far as size is concerned. Indeed, it is a wonder how so large a structure could have been erected entirely in stone for 46,000*l.*, the sum it is reported to have cost. In the description published in the local papers on the occasion of the opening it is mentioned that the design had to be cut down to reduce expense. This is patent everywhere, and the cutting down process has been so severe as to be ruthless. The conception—said to be based on the Church of St. Vincent de Paul at Paris—is a fine one, and, apart from some faulty detail, the building would have been a worthy monument of the Catholic Church if carried out with reasonable solidity. But the walls are too thin, and this alone gives the building a starved and pretentious appearance. When, however, details are examined, and we find that the staircases are of the cheapest cast-iron stock circular pattern, that visible abutments to the arches of the crossing are non-existent, and that the ceiling of the nave and the dome and semi-dome of the sanctuary are of thin but over-ornate stamped steel sheets with nothing behind them, then the conviction is forced upon one that it would have been better to be content with a smaller and less ornate edifice built on sounder lines. The sketch plan (Fig. 2) gives a rough idea of the general arrangement. Above the narthex is a spacious organ-gallery, and over the aisles other galleries, as in some of the Early Roman Basilicas. The close spacing of the columns is also Basilican, but the colonnaded apse and whispering-gallery under the dome are features of later date. Apart from the faults just mentioned and minor ones of detail, the interior is a fine one, and is, on the whole, more satisfactory than the exterior. The difference in scale between the upper stage of the western towers and the portions below is so marked as to make one think the architect must have been coerced into a modification of his original design, and the way in which the drum of the principal dome is splayed out into the square is crude in the extreme. The transepts, again, are attached to the nave instead of supporting the dome and crossing, and thus intensify the weakness of the supports of the latter. As to materials, the walls and features are wholly of soft white Oamaru stone, with Timaru blue stone plinths; the roofs are covered with red tiles from Marseilles, on Oregon timber rafters. The domes are covered with copper, the flat roofs asphalted, and the floors are of concrete. The greatest length is 210 ft., the width, 106 ft.; the height to the top of the dome, 135 ft.; while the nave is 92 ft. 7 in. by 42 ft. 6 in. by 48 ft. in height. On leaving the edifice and passing through Cathedral-square one's final thought is that, after all, the far smaller but well-built Anglican Church quite holds its own in every way, and is indeed much to be preferred to its more pretentious rival.

The group of buildings which, however, give a special *cachet* to Christchurch have not yet been referred to. Most of them, such as Canterbury College, the Museum (Fig. 1), the Boys' High School, the Normal School, and the Law Courts, have been built a good many years, and they are all in the domestic Gothic manner of the latter half of the last century, and in general fair specimens of the style. The Museum especially is very thorough, the whole of the interior, which is mainly of wood, being well detailed. One cannot help feeling that, however suitable such buildings may be in England amongst historic surroundings, they are somewhat out of place in a new country of wider spaces, more open outlook, and in many ways more advanced thought. The people, their institutions, and their politics are really very modern, and some form of Renaissance would, therefore, be more in harmony with their ideas. Loyalty to the ideal set up by the founders of the province has hitherto kept them faithful to the accidentals associated therewith, but now that Christchurch is more cosmopolitan than Anglican it would be well to give up what has already been abandoned in England. This has been done in the commercial quarter, but that the old idea still persists the new municipal buildings are evidence. They are well designed in brick and stone, but, while the windows are mullioned, there is a breadth and simplicity in detail that is lacking in the more archæological older work. The Law Courts in the same locality look quite fussy in comparison, though they are undeniably picturesque in outline, and charmingly situated amidst grassy lawns near the winding Avon (see plate). The modern spirit is also in evidence in the hospital. Commenced a good many years ago, its Gothic half-timbered open corridors and some of the buildings are charmingly quaint, but it has evidently been found that they do not suit modern requirements, for in the newer wards a more modern form of Renaissance has been adopted. One great advantage, however, in a Colonial City like Christchurch is that this change of idea and change of style strikingly shows history in the making, and so gives it an interest that is unique in the Britain of the south.

The conservative instincts of the well-to-do section of the citizens are also evidenced in their domestic architecture, which is much more English in type than in any of the other cities of New Zealand.

On the western side of the town, near Hagley Park, and beyond it in the leafy lanes and roads of Fendalton and Riccarton, many charmingly-designed dwellings are to be seen, some few of which might have been transported almost bodily from the neighbourhood of an English country town. But the prevalent type leans more to single than to two or three story houses, and the roof coverings are usually of iron, while the walls are mostly of weatherboard. Here, again, local conditions have modified the type aimed at. In the first place the people generally are so prosperous that the shortage in domestic help is very pronounced, and hence a single-story cottage is much preferred to a two-story dwelling, as being more easily worked. Then the prevalence of earthquakes, usually not very serious but quite sufficient to cause alarm and sometimes damage, makes a wooden building covered with light sheets of corrugated iron preferable to bricks and tile or slate. On this point cost also is a factor, as wages are very high and the hours of labour short. But to maintain as far as may be the tone of an old country town, these suburban dwellings, especially the more recent ones, are painted a deep dull red, roofs and all. Amongst the leafy trees and abundant vegetation this looks exceedingly well, and in winter time also, when the boughs are bare, the warm colour would be equally pleasant. Of course, the majority of the older dwellings are of the usual commonplace weatherboard Colonial type, and some are truly awful examples of misplaced ingenuity, with their sham rusticated quoins and other wooden imitations of stone features; but it is to be hoped these are now things of the past. There is, however, only one really vulgar dwelling in the whole of the city, and that is very large and very aggressive amongst its small cottage surroundings, and reminds one very much of a *nouveau riche* cotton-spinner's house of twenty or thirty years ago in a Lancashire manufacturing town. Most of the dwellings are small, but for absolute compactness a little week-end cottage on the sea coast is remarkable, and may even be suggestive to home readers, so a sketch plan is here given (Fig. 3). It measures over all 22 ft. by 16 ft., and may surely be regarded as the irreducible minimum. Being only intended for summer use there is no fireplace, and cooking is performed on an oil-stove in the little kitchen, about the size of a small pantry. The beds for the husband and wife are bunks one over the other, like those in a ship's cabin, and visitors (of one sex) may be entertained, as, in the living room, the settees by day form beds at night. With this unique example one may take leave of Christchurch, a city which does not impress one at a first glance; but, like everything that possesses real charm, it grows upon one daily, so that when the time comes to leave it is with sincere regret and a firm belief that it will progress in the future as it has done in the past, and that the ideals of its founders will be realised, if not in the exact way they intended, yet on stronger, fuller, and broader lines, and permeated by the same high principles that inspired them.

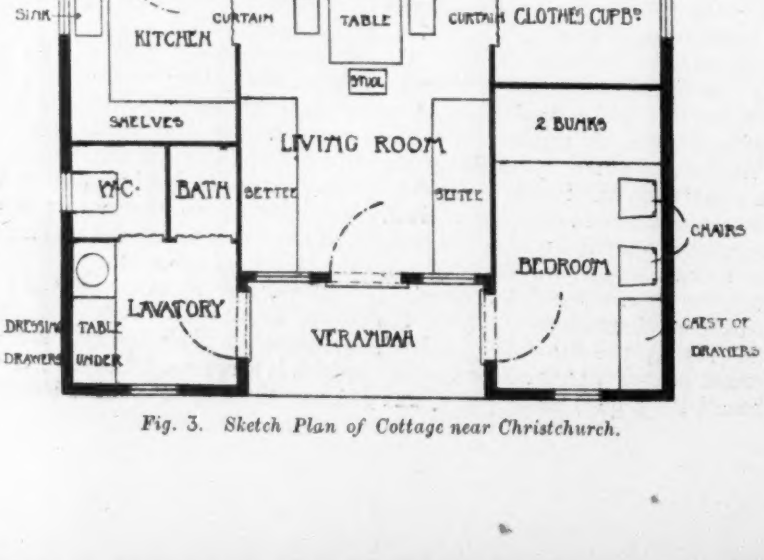


Fig. 3. Sketch Plan of Cottage near Christchurch.

NOTES.

The Garden City.

AN interesting conference in regard to the Garden City, as it is called, at Letchworth, took place last week. It was perhaps a little too academic in character, the most practical thing which was said being the statement of Canon Rawnsley that the bubble of cheap cottages had been pricked, and that those built at Letchworth for 150*l.* would really cost far more if built by an ordinary landlord. It has not redounded to the credit of those who have charge of the Garden City that they should have induced so many persons to visit the city to view these cottages, when, in fact, their cost if built under ordinary circumstances would be greater than 150*l.* We trust that the idea of the Garden City itself, factories and dwellings in close proximity in a semi-rural district, may have better results than the Cheap Cottage Exhibition. As we have more than once said, its results are likely to be beneficial in an indirect rather than a direct manner, namely, by making local authorities more careful in regard to open spaces, the planting of trees, and so forth. At present the tendency of manufacturers to place buildings at the Garden City seems but slight.

The Latest American Railway Disaster.

OWING to the universal employment of double-track permanent ways on all main line railways in this country, and the rigid precautions adopted on the few single-track lines which are in existence, the latest catastrophe in the United States conveys no moral to us so far as concerns railway working. It is very evident, however, that the occurrence on the Denver and Rio Grande Railroad, in Colorado, ought to serve as a serious warning to American railway proprietors and managers. Until the proprietors adopt the most desirable precaution of providing separate tracks for up and down traffic the safety of the travelling public must depend absolutely upon the efficiency of the safeguards provided by the management to prevent trains running in opposite directions from colliding end-to-end, as happened on the Rio Grande Railway. The general manager of that line is said to attribute the collision to a "misunderstanding of orders by the engine-drivers of both trains." So far as can be judged from the reports available, it would appear as if the two trains were started on their death-dealing career under the control of drivers who had certain discretionary orders, which one or both of them failed to apply in a judicious manner. Surely American ingenuity ought to be able to devise a system of signalling by which continuous control could be exercised over trains on the road. If not, American railways should send deputations of their chief officials to study British methods of operation, and we feel sure that, if willing to learn, they would very soon find out how to obviate the constant accidents which are so common in the United States. The terrible fire which followed the Colorado disaster furnishes for us one more reminder of the absolute necessity for non-combustible rolling-stock, which indeed ought to be made compulsory by Act of Parliament.

Workmen's Compensation.

HIS HONOUR JUDGE BRAY has had to determine an important point under the Workmen's Compensation Act as to whether timber stacked in a yard constitutes a "warehouse." The yard was 11 yds. by 24 yds., bounded on two sides by walls of neighbouring houses 25 ft. in height, and enclosed at back and front by fencing 12 ft. high. The County Court Judge held this yard, with some 80 tons of deals stacked in it, not to constitute a warehouse. Considerable difficulty has been experienced in determining what is a "warehouse" within the meaning of the Act, and two of the tests which have been applied are:—Is the store used for wholesale purposes or merely ancillary to retail business? Is the warehouse covered in? In the present case the yard fulfilled neither condition. Ninety per cent. of the sales were retail, and the yard was open to the sky. Neither of these tests is, however, satisfactory, and it is to be hoped that the promised Government measure will deal with this question. The amendment proposed by the Departmental Committee would place the matter beyond doubt. It was suggested that the Act should extend to employment "on or in or about the storage of goods for sale or safe custody by way of trade or for purposes of gain."

Claims against Tube Railways.

A CLAIM was brought last week before the High Bailiff for Westminster and a special jury by a leaseholder of certain premises in Long Acre, with sixty-eight years of the lease to run, for 1,200*l.* or 1,400*l.* compensation for interference with the subsoil against the Great Northern, Piccadilly, and Brompton Railway Company. Counsel for the railway company asserted that this was the first claim ever brought against a tube railway company by a leaseholder, and he was prepared to argue before another Court that there was no right to claim compensation at all. The public have, however, been deprived of hearing this question argued, for the jury having heard the evidence decided that nodamage had been sustained by the claimant. The railway ran 120 ft. below the surface of the roadway, beneath 78 ft. 6 in. of solid London blue clay. The tube railways are under special conditions as to compensation, since it was decided in Committee that a general clause should be inserted in their Bills dealing with the time within which such claims can be made and the character of the damage which can be made the subject of a claim. Ordinarily no claim will lie against a railway company for damages caused by its working as apart from its construction. On this question see our Note, May 17, 1902.

Radial Trucks for Tramway Cars.

IT is well known that when a four-wheel truck is passing round a curve considerable grinding takes place between the leading outer wheel flange and the rail. This action has been generally attributed to centrifugal force alone, but that is probably not quite the correct view, as Professor Carus-Wilson demonstrated in his recent lecture to the members of the Tramways and Light Railways Association. The natural tendency for a truck with a rigid wheel-base when passing a curve is to roll straight on in the direction of its wheel-base, thereby giving rise to an additional force which, when the speed is small, assumes large proportions as compared with the centrifugal force. The obvious remedy is to pivot the axles on the principle of the bogie. But there are objections to this form of apparatus which account for the attempt made to secure radial action with only one axle on each truck. Professor Carus-Wilson described and illustrated several types of radial trucks which are being tried in various parts of the country. At present it does not seem to be conclusively established that radial action can be secured at the low speed necessary when curves are being negotiated, although it has been stated that at Chesterfield the trucks actually radiate at car-speeds of less than three miles an hour. It should be noted in this connexion that the desideratum is an apparatus actually capable of radiating, and not merely a "flexible" truck that can be forced by the grooved rails to accommodate itself to the track. Action of the latter kind may cause as much grinding as would result from the use of a rigid wheel-base truck. Radial types of truck are now being tried upon upwards of thirty tramway systems, but so far with inconclusive results. It may be hoped, however, that the experimental working will before long indicate the direction in which success may be finally attained.

Motor Vehicles.

THE growth of motor-car traffic can be gauged by the figures issued from time to time in connexion with their licences. The figures now published by the Public Control Committee of the London County Council for January give the total number of cars registered in London as 9,049, and of cycles 5,138. These figures show an increase of 990 motor-cars and 330 motor cycles in four months, the figures up to September 30 of last year having been respectively 8,059 and 4,808. We are glad to observe that the motor cycles do not increase as quickly as motor-cars, as these cycles add to the dangers of the streets far more than any other conveyance, and provide a method of locomotion which should be discouraged in a city.

Concrete-Steel Workshop Buildings.

ATTENTION is drawn in a paper read by Mr. E. N. Hunting before the American Society of Mechanical Engineers to the advantages of reinforced-concrete for the construction of modern factory buildings. After pointing out the strength, fire-resisting qualities, durability and economy of this material, the author selects for detailed description and illustration a workshop, 160 ft. by 102 ft. wide, erected in Pennsylvania. The main conditions specified for this building were:—(1) That it should be absolutely fireproof; (2) that it should be built at a minimum cost; (3) that provision should be made for heavy craneways; and (4) that the design should have some artistic value. Several useful drawings are given of the columns, beams, crane runway, and arched roof construction, and the value of these illustrations is much increased by the fact that they have figured dimensions in every case. The photographic views are not very convincing as to the artistic merits of the structure, but in other respects it seems to be quite satisfactory. The cost per cubic foot is stated at 1·625d., and as the rate of insurance was reduced to 1s. 3d. per 100*l.*, it may be considered that the fire-resisting qualities of the building are all that could be desired.

Action of Sea Water upon Concrete.

INVESTIGATIONS conducted into the causes leading to the failure of concrete in dock works have abundantly established the fact that when Portland cement concrete is sufficiently permeable to permit sea water to act continuously throughout its mass, the cement will become disintegrated and ultimately be destroyed as the result of chemical action. Mr. J. Watt Sandeman, M.Inst.C.E., is an acknowledged authority on concrete, and a pamphlet recently written by him possesses special value for the reason that it contains, in concise form, directions for making concrete capable of retaining permanent stability in docks, piers, and other structures exposed to the action of sea water. As pointed out in a recent "Note," the essential quality of concrete to be used under such conditions is impermeability. Mr. Sandeman now gives clear instructions for insuring this essential. We do not propose to quote figures here, but can sum up the points necessary for success in a few words. First, the proportion of the cement in the mortar must be such that all voids in the sand are entirely filled; and, second, the proportion of mortar to aggregate must be sufficient to fill the voids in the aggregate and to surround all the particles. To satisfy the first point the percentage of voids in the sand must be ascertained. To satisfy the second point the percentage of voids in the aggregate must be known, and the reduced volume of mortar, as compared with the original separate volumes of cement and sand, must be ascertained. Those who wish to save themselves trouble will find the tables prepared by Mr. Sandeman of service; they contain standard proportions for qualities of concrete, with and without "displacers," for special parts of dock and pier works, for ordinary marine works and reservoir walls, and for land works where impermeability is not essential. Altogether fourteen different types of concrete are tabulated, and the pamphlet concludes with a convenient method of ascertaining the weight and cost of various mixtures.

Economies in Electric Lighting.

THE paper by Mr. G. Wilkinson which was read to the Leeds local section of the Institution of Electrical Engineers is a useful and instructive one. He describes how consumers in many cases fail to obtain the full advantage of the electric power which they pay for in their meter bills, and he suggests that central station engineers should study carefully the private installations they supply, so as to ensure that their consumers get the amount of light to which they are entitled. Mr. Wilkinson's method of certifying lamps is useful, but we think the system adopted in Bradford of supplying free lamps is preferable. The cost to the supply company is only a small fraction of the receipts from meter bills, and the supply of free lamps can be used to induce consumers to pay their bills promptly. For instance, at Bradford, the cost of the 14,000 lamps distributed last year was only 3 per cent. of the total receipts, and it was stated in the discussion that the bills were paid with gratifying regularity, as the consumers felt the loss of free lamps much more keenly than losing the small discount formerly given. In America the custom is to supply new lamps whenever they are required, and the engineers are careful to supply the best on the market. Lamp-makers complain that the pressures of supply in this country are not sufficiently varied, so that those lamps—technically known as "outfalls"—which are not of the proper efficiency at the standard voltage, are unsaleable. This may explain possibly the large percentage of unsuitable lamps sometimes found in a private installation. Mr. Wilkinson stated that he recently found in a public building eighty 32-candle-power lamps, which consumed about 40 per cent. more power than the average lamp. Replacing them all by more efficient lamps effected a saving of more than 100*l.* per annum.

The Warming of the Law Courts.

WE are glad to see from a reply given by Mr. Lewis Harcourt last week to Mr. Arnold Herbert, M.P., that the Office of Works is at last going to have the corridors

of the Law Courts which adjoin the Chancery Chambers and the Admiralty Registry heated. Although space was left when the Law Courts were built for warming these portions of the building, no heating system has yet been carried out. In no other country would such extraordinary want of care be found, since the omission to heat these passages causes great inconvenience, as well as immense waste of fuel in the adjoining rooms. The tendency in America and on the Continent is to overheat public rooms, but in this country we often have run into the opposite extreme. That main corridors in public buildings should be warmed in winter by hot air or water cannot, we think, at this time of day be doubted.

The Sanitary Condition of Sleaford District.

DR. MAIR'S Report to the Local Government Board on the "Sanitary Circumstances and Administration of the Rural District of Sleaford" discloses an exceedingly bad state of things in regard to drainage and water supply. In a few cases houses in villages are not provided with drains at all; slops are then thrown upon the garden, or into a roadside channel or ditch. Where house drains do exist, or are believed to exist, very little indeed is known of their course and character, and it was very rare to see any provision for their ventilation. The sewers which have been provided in many of the villages are either road drains constructed of agricultural pipes, or sewers which have been constructed of glazed earthenware pipes purposely to receive sewage. With only three exceptions, the contents of these sewers are allowed to discharge direct into the nearest available ditch, stream, or beck. In some cases, the water of the stream into which sewage is so allowed to discharge is used for drinking purposes by the inhabitants of the same village; in other cases the water is so used by the inhabitants of a village or villages lower down in the course of the stream or beck. In a district where most if not all the streams are more or less polluted with sewage, and where the ground in the neighbourhood of houses is liable to soakage of excremental and other refuse matters, it is clear, says Dr. Mair, that the drinking water supply of the inhabitants should be made secure against contamination. Some of the villages are mentioned which possess excellent water supplies, obtained by means of deep bores into the Oolite; but all the others in the district are dependent for drinking water upon private surface wells or upon streams, polluted as before described. In regard to this question of water supply Dr. Mair asked the Chairman of the Rural District Council why a certain village had no water supply like the villages on either side of it; "he said he supposed that the reason was that the village had not asked for it; and on inquiring what would lead a village to ask for it, he informed me that practically it would be either scarcity of the existing supply or an outbreak of enteric fever," a reply which certainly needs no comment.

A Celebration at Ely Cathedral.

THE Dean and Chapter intend to celebrate this year the 800th anniversary of the consecration, on October 17th, 1106, of Ely Cathedral. The first church appertained to the abbey founded in 673 by Etheldreda, daughter of Anna, King of the East Angles, and wife of Egfrid, King of Northumbria, for monks and nuns, and dedicated to the Blessed Virgin Mary, of which she became the first abbess. The Danes destroyed the greater portion of the monastery two hundred years afterwards. Some monks who escaped from the massacre partially restored the buildings; in 970 King Edgar sold the Isle of Ely to Ethelwold, Bishop of Winchester, who rebuilt and endowed the abbey for an abbot and regular monks. Henry I. gave Richard, tenth and last abbot, permission to establish a see at Ely, and in 1107 Hervey, expelled by the Welsh from his see at Bangor, was appointed as first bishop of a diocese which then included the whole of the county of Cambridge, taken out of that of Lincoln. At the suppression of the monastery, re-dedicated to SS. Peter and Etheldreda, Henry VIII. converted the priory church into a cathedral dedicated to the Holy Trinity, and endowed it with the site and the revenues, in part, of the dissolved religious house. Simeon, ninth abbot, laid the foundation of the present cathedral in 1081, upon a plan which his brother Walkelin adopted, with the addition of a crypt, at Winchester. In the presbytery is the shrine of the foundress, of whom the Anglo-Saxon Chronicle relates that in the year 673 Saint Etheldreda began the minster at Ely. For particulars of the fabric we may refer our readers to Mr. D. J. Stewart's article—one of our "Cathedral" series—with plans, views, etc., of April 2-9, 1892, and the illustrations we published on July 21, 1888 (interior of one of the small western transepts), February 16, 1901 (Galilee porch), and October 18, 1890 (the prior's door).

Union of Benefices: St. Peter-le-Poor and St. Michael, Cornhill.

THE Ecclesiastical Commissioners have sealed and presented to Parliament a scheme framed, in pursuance of the Union of Benefices (Metropolis) Act, 1860, for uniting the benefice of St. Peter-le-Poor, Old Broad-street, and St. Benet Fink with that of St. Michael, Cornhill. To the new rectory the Drapers' Company have nominated Canon G. C. Bell, formerly headmaster at Marlborough. The proceeds of the sale of the site and materials of the church of St. Peter-le-Poor are applied under the scheme towards the erection of two, or three, new district churches, provision being made for grants in aid of the services and fabric funds of the churches of St. Michael and All Hallows-on-the-Wall. The church of St. Peter-le-Poor was rebuilt in 1791-2 after Jesse Gibson's designs in the classic style, upon a circular plan, with an internal diameter of 56 ft.; the organ, by Green, 1792, was enlarged and improved by Castello thirty years ago. Wren's church of St. Benet Fink, or Finch, stood in Broad-street Ward, near Finch-lane, on a site between the present Bank of Australasia, Threadneedle-street, and the Royal Exchange. It was finally dismantled in December, 1845, when the monuments were removed to St. Peter-le-Poor. The stone tower, being similar in design to the brick tower of St. Benet, Paul's-wharf, was surmounted with a lead-covered swelling cupola carrying a lantern.

The Institute of Painters in Water-Colours.

THE large rooms of the Institute of Painters in Water-Colours are a snare to them. There is not the quantity of good work forthcoming that is necessary to fill the walls, and one has to run the gauntlet of a whole tribe of mediocrities to come at the few things really worth looking at. If the exhibition were confined to the medium-sized room of the three it would be a much better one. Worse than mediocrities are such things as the fantasias of Mr. Hal Hurst, which are clever in a way, but a very bad way. Among the things that may be picked out as of more than the average level are Mr. Haité's "A Venetian Fruit Stall" (187), the most important and most successful water-colour by him that we have seen; Mr. Winter-Shaw's "A September Evening" (197); Mr. Bernard Evans's "A Path Through the Woods" (201); Mr. J. T. Watts's beautiful little landscape "Barningham Moor" (79—the merits of this kind of work do not seem to be appreciated, or this would not be hung so high); Mr. David Green's "Lighting-up Time, Whitby" (218), a careful working out of a difficult effect; Mr. T. Pyne's "A Sunny Morning" (226), a good example of the old style of carefully finished water-colour; and all of Mr. Frank Walton's set of pictures from Sark (306, 311, 314, etc.), which are really worth looking at carefully. Mr. John White, one of the best names in the Institute, is as excellent as usual in "Shades of Evening—Dartmoor" (324). Then there is Mr. Weedon, one of the few remaining adherents of the School of David Cox, whose "Autumn Day on the Moors" (330) is in his best style. Mr. Cyril Ward's "A Valley in the South Downs" (346) is a good large landscape of the realistic type—what we may call a "conscientious" landscape; Miss Alice Hobson's "The Ruins, Bradgate Park" (388), is something more than that, and is one of the best drawings in the Gallery; she has a fine sky, too, in "Exmoor" (402). Miss Vaughan Jenkins exhibits a well-drawn interior of "Christchurch Cathedral, Oxford" (384), and another lady exhibitor, Miss Alice Squire, pleased us with two or three small landscapes representing different aspects of nature in Spring and Autumn. Mr. Munnings, whose name we do not remember before, is able in the foreshortening of horses, as in "On the Common" (86), but the colour is unsatisfactory. There is a certain amount of what we call the flattery of imitation; Miss Hagarty (128) and Mr. A. MacBride (275) are obviously taken by the peculiar manner of Mr. Paterson as recently exhibited at the older Society; and elsewhere we find a member endeavouring (not very successfully) to "do Alma-Tadema," as one may say. Mr. Nisbet's "Solitude" (462) is meant to be, and is to a certain extent, poetic, but perhaps a little stagy. Among other good names of exhibitors are those of Mr. Fulleylove, Mr. John R. Reid, and Mr. Aumonier; but none of them quite at their best.

Mr. Nelson Dawson's Ironwork.

MR. NELSON DAWSON'S showroom at 111, Jermyn-street, St. James's, is at all times a place of interest. At the present time some fine specimens of forged ironwork

of elaborate and interesting workmanship are on view. The largest exhibit consists of railings for a tomb, with a large memorial cross in bronze. The sides are divided into panels decorated with rose designs; the ends are similar with the panels decorated with lilies. The work in these is very vigorous and fine, and there is a beautiful little group in the cross entitled "Charity." There is perhaps a lack of what we may call architectonic grip in the design, and a feeling of smooth roundness in detail, which prevent the whole from being as successful as it might otherwise have been. Mr. Nelson Dawson has been influenced by "L'Art Nouveau," and we hope he will return to the severer restraint in line, in form, and in detail, of the older work; a restraint which produced the extraordinarily rich and beautiful work to be seen in the galleries at the Victoria and Albert Museum. A little bronze, "The Light of the World," daintily set in marble, is very beautiful, and there are besides many useful and ornamental objects in metal-work which will stand the hardest wear and give pleasure to the eye besides.

Waterloo Bridge.

THOSE who care about preserving the architectural character of a great monumental work (but a small minority, we fear, in this country) may now have the satisfaction of seeing that Waterloo Bridge has been freed from the disfigurement of the wretched commonplace lamp standards which the engineering department of the London County Council was allowed to place there, without the slightest consideration for the architectural character of the structure. These are at last removed and replaced by standards of the original fine and monumental design. The immediate moving influence with the London County Council in making this change was the strong representation made by the Architectural Vigilance Society, but we think it is only just to ourselves to record that the Society's action was due in the first instance to the Editor of this journal, who brought the matter under their notice, and but for whose initiative the shop-pattern lamps might be there still. It is gratifying to find that the Bridges Committee of the County Council seem at last to have recognised that the design of the lamp-standards has some relation to the design of a bridge, and it is to be hoped they will not again give an engineer a free hand to supply details of this kind without any reference to architectural style.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Mr. E. T. Hall, Vice-President, presiding.

The Chairman said they would all be sorry to hear that the President continued to be very ill. He had now been in bed for three weeks, but they would all hope he would be present at their next meeting. Mr. Belcher himself was exceedingly sorry that he was unable to be present.

The Late Mr. Bartlett.

Mr. Alex. Graham, Hon. Secretary, said he regretted to announce the decease of Mr. William Giles Bartlett, who had been a Fellow for forty-eight years, having been elected an Associate in 1858 and a Fellow in 1869. His son, Mr. Sidney Francis Bartlett, he was glad to say, was now a Fellow of the Institute. On the occasion of the funeral the previous Thursday a wreath was sent on behalf of the Institute in sympathy with the relatives of their deceased colleague.

The Strand Further Improvement.

Mr. Maurice B. Adams asked why the Institute was not represented in connexion with the Strand further improvement memorial which had been sent to the London County Council that day. The Institute had taken a very prominent position with regard to the matter, and almost every society was mentioned in the memorial except the Institute.

The Chairman said the Council of the Institute did not think it wise to take part in the particular movement to which Mr. Adams referred, because they had made their own representations to the County Council, and had only quite recently been in communication with them in the direction that the Institute decided to take about a year ago.

Leadwork.

Papers were then read by Mr. F. W. Troup and Mr. Lawrence Weaver, F.S.A., on "Leadwork," the following being abstracts:—

Mr. Troup said that, as the architect had frequently to decide what metals should be used on a building, it was imperative he should know the peculiar properties of each, and why lead ought to be used in one case, cast-iron in another, and pewter or copper in a third. To bring out the most prominent qualities of lead—viz., its durability at ordinary temperatures, its ductility, its exceptional weight, and its low melting-point—the lecturer compared it with other metals in common use, showing its advantages for open-air purposes over copper, tin, zinc, iron, etc. Lead required, however, great care and judgment in its use. As regards the material as now supplied—milled lead and cast sheet—milled lead is a dull and pasty material compared with lead run out in the old way by casting the molten metal on a sand-bed to the actual thickness required for use. Cast sheet can be had in the open market at the present day at a rather higher price than milled sheet of the same weight. For a flat lead roof, often liable to be walked upon, there is not much to be gained from using cast sheets. The surface texture of the cast sheet, however, is worth making some slight sacrifice to obtain, especially if the old-fashioned open roll or flat welt-roll can be used. Either of those joints is preferable to the usual modern roll with its wooden core. The wood roll has to be large, and therefore clumsy, else leaks arise from capillary attraction between the sheets. The open roll has not this defect, but cannot stand under much foot traffic. When lead is used in a spire or turret it is certainly worth while to use cast sheet. Even with a wooden core in the rolls the cast sheets do not cause suction to such an extent as milled lead. The natural surface of the lead as it is cast is the best to use as the exposed surface in a roof or elsewhere. When there is ornament of any sort to be cast with the sheet, then the under or sand surface must be exposed. This can be as rough as you like for roofs or rain-water heads, and a coarse sand may be then used for the casting bed. But for things which come close to the eye, or which may be handled, a much finer sand should be used. More care is then required in the casting to provide for the escape of the steam formed by the molten metal on the damp sand. For a "repeat" ornament or for casting letters and figures for dates a lead mould can be used. This is easily made, and lasts for a long time, but a brass or cast-iron mould is more permanent. For knobs and finials it is possible with a lead or brass mould to fill it with molten lead, and after two or three seconds empty out the interior unsolidified lead, giving a hollow casting without the trouble and expense of making a core as for a brass or iron casting.

For decorative forms the lecturer counselled restraint; lead was so easy to twist and turn. The designer should never forget his material while designing on paper; even in modelling the final material must never be lost sight of. It is quite possible to make a casting from a single pattern in several different materials, but to take full advantage of the best that can be got out of each material that original pattern ought to be varied in each case. For a plaster cast, for example, moderately high relief may be had; but it should be soft in contour, and there is no special reason for economy in material. In lead, however, there is reason for economy of material, and one can have finer lines, and can reckon on bending, soldering, or even to some extent bossing up the casting after it is made. There are several other ways of ornamenting lead. It is very easy to make fretwork patterns for ventilating panes in windows, or as a vallance round a leaded dormer or door-hood. This is best done with chisels and gouges on a block of lead. Lead can also be incised, and the incised lines filled with various coloured mastics in letters or other shapes. One of the most gorgeous possibilities for decoration in lead is to be had by tinning the metal in some design of ornamental or figure decoration and then glazing over the tin surface with transparent colours.

In the Middle Ages the chief method of working lead and using it in buildings was simply to take the plain cast sheets, and, after cutting it to the outline as near as might be, and in convenient size for handling, to dress, boss, and beat it up to the shape required. Sometimes these forms were carried on wooden cores; at other times on a framework of iron, or were simply fixed by iron hooks and brackets on the timber framing. This art is as dead as Queen Anne. It is a personal art, like sculpture—very often it was sculpture—and no amount of designing by another for the craftsman to execute will do much to restore it. The art has been so long divorced from the craftsmanship, and the teaching of tradition so long deserted, that their reunion is hardly a matter to be accomplished in a single generation. We can but live in hope.

Mr. Lawrence Weaver took for his subject the earlier lead spires. Lead, he said, had no nobler use than in the covering of spires, for spires were the greatest concession that Gothic architecture had made to constructed beauty and symbolism. The lead spire has a character all its own, and maintains its character of a spiritualised roof more intelligibly than a stone spire can do. The white, almost glistening patina which comes with age on lead, where the air is not befouled with smoke, makes the spire stand like a frosted spear against the sky, and the slight twists, which almost every timber spire has taken, give a peculiar sense of life. These were refinements which did not fit in with Mr. Goodyear's theories. Dealing with the history of lead spires, and discussing the question of origins, the lecturer quoted the classification of spires given by Mr. Francis Bond in his "Gothic Architecture," and gave his reasons for offering the following classification, based on Mr. Bond's, but corrected:—

PATHLESS SPIRES—

I. *Collar-type—e.g.*, Ryton.
II. *Broach-type—e.g.*, Braunton, Barnstaple, Godalming, Ickleton, Swymbridge, Almondsbury.
III. *Pinnacled-type—e.g.*, Long Sutton, St. Nicholas, and Aberdeen.

PARAPETED SPIRES—

I. *Collar-type—e.g.*, St. John's, Perth, the tower of which has a heavy oversailing parapet, within which the spire stands.
II. *Broach-type—e.g.*, Hemel Hempstead.
III. *Straight-sided type—e.g.*, Harrow, Chesterfield, Minster, Great Baddow, Much Wenlock, Wickham Market.
IV. *Spirelets—e.g.*, East Harling, Wenden Ambo, Swaffham, Hitchin, Sawbridgeworth, and Ash, Kent.

A certain difficulty arises in the definition of lead spires owing to the somewhat loose use of the word "broach." What the lecturer called the "collar-type" is sometimes called "broach," but incorrectly. The essence of the broach he took to be that the filling-in between the angles of the tower and the diagonal faces of the spire shall be of pyramidal form. The influence of the stone broach on the form of the lead broach may be admitted without suggesting that the lead broach was a slavish or unintelligent copy of the stone broach. It was a question of carpentry. The construction of the collar-type is more congenial to wood than is the broach. The octagonal framing calls (but not very urgently) for strutting at the base. In the broach the main framing is strutted by single timbers running through the diagonal faces of the octagon; and this is not so satisfactory as the double strutting of the cardinal faces, which obtains in the collar-type. From the

weathering point of view the lecturer considered the stone broach to be as efficient as the collar-type, and he felt strongly that the broach was far the more attractive. Having given details and brought out the chief characteristics of examples of the different types classified, the lecturer made some remarks by way of constructive criticism. His illustrations, he said, had shown how beautiful lead spires can be and are. The lead gave the architect no trouble: he gained infinite variety of surface by different arrangements of the rolls; he outlined great cartoons on the faces of his spires (as at Chalons-sur-Marne) and blazoned them with gold and colours; he wanted the metal-cased architecture of the poets, and he got it. His difficulty was that he could not keep it. The timber framing was always liable to destruction by fire. To-day, however, there is an alternative. Our spires can be built in steel and sheathed in lead, and will defy the flames. Here is one field where steelwork may come into its own, may come faithfully and gracefully, may be the metal bones of a metal architecture. The lecturer claimed for it that it preserved the initial idea of a spire, that it is a glorified roof; that the lead surface gives opportunities for colour treatment that a stone spire cannot give. Had the mediæval architect found the material to his hand, we should be pointing to-day to his leaded steel spires as notable examples of the Gothic spirit. In conclusion, the lecturer showed a design for a leaded steel tower done by Sir Charles Nicholson to illustrate his suggestion. The design, he said, was instinct with the poetry and mystery which are the characteristics of great architecture. He could only hope that some ecclesiastical Mæcenas would be found for whom Sir Charles could materialise this dream church encrowned with lead.

Lieut.-Colonel Prendergast, in proposing a vote of thanks to the readers of the papers, said the meeting had given the greatest satisfaction, as it was a little out of their usual groove. He doubted if there were many even there that night who knew much about leadwork in its artistic sense, and yet there were few great architectural works throughout Europe which were not much indebted to the leaden statues and lead works with which they were surrounded. The uninitiated, the idle, and the careless did not know the immense value of lead when used architecturally. He did not pretend to be an architect, but he had been an honorary member of that Institute for many years, and had a great love for art, and he never went to Westminster without wondering that this country, which in Westminster Hall had one of the most interesting and remarkable halls in the world, had left it standing in front of the great abbey with such a ramshackle roof, instead of replacing it with a glorious leaden roof. It was perfectly astounding to him that a great country which professed to have some love of art and of architecture should be unable to realise that a splendid building like this was absolutely ruined for want of a leaden roof. The great architect who built the Houses of Parliament never meant that the hall should show itself, but for some reason his plans were altered, and, as the nation had chosen to have the hall exposed, they ought to make it what it should be. With reference to the spire of Chesterfield Church, he had for the last fifty years been trying to find out the reason for the twisting, and the conclusion he had arrived at from all the information he could get was that the thing was deliberately done.

Mr. H. V. Lanchester seconded the motion, and said he would like a little more information with reference to the tinning or the application of other metals to lead. He would also like to know a suitable method for putting lead on construction. He did not think that Mr. Troup need plead the cause of lead to any architect, for they all liked it and realised the fine conjunction it made, particularly, with Portland stone. He did not think any two dissimilar materials like lead and Portland stone ever produced such harmony. He should like to know if they could get a thoroughly fire-proof construction, such as concrete or ferro-concrete, and attach lead in a satisfactory way. It seemed to him that it would be possible, but Mr. Troup had more experience than most of them, and they would like his views on the matter.

Sir Charles Nicholson asked what timber was used at Chesterfield. Was it oak? He had always understood that the cause of the twisting of the spire was that green timber was used, and it occurred to him that possibly a good deal of elm might have been used for some reason or other. They all knew that elm was a timber very apt to twist and curl up, and a simple explanation like that might possibly account for the twisting of the spire.

Mr. C. Harrison Townsend said that reference had been made to one who was well known as having helped very greatly to revive the interest in their own time in the craft of working in lead—he referred to Professor Lethaby; but he thought Mr. Lethaby would be the last to deny that there was an earlier worker in the field, whose interest also showed itself in working in lead, more or less elaborated, in his architectural work. He referred to Mr. Eden Nesfield. Some of them would remember his earlier works, and those who, like himself, were privileged to work alongside him would remember particularly how keenly he sought to revive the interest in lead at a time when it was simply used for plumbers' work. He remembered one work, which he believed was at Babbacombe, where Mr. Nesfield introduced lead cornices, with moulded and cast figures supporting them at intervals, and a lead parapet divided into panels, each panel being enriched with a different motif. This was done at a time when his fellow architects did not dream of using lead for anything but to cover a flat roof which they did not particularly wish anyone to see. He was glad to be able to draw attention to the work of one whose work he felt had not received the recognition that it should have received.

Mr. Maurice B. Adams said that it had occurred to him to use uralite where lead and iron came together. He did not know whether Mr. Troup had ever thought of that, or whether anyone had so used it, but he thought that the necessity of keeping lead away from iron might be met by using strips of uralite, which was extremely hard, and could be used like wood. Uralite was composed of asbestos, consequently no chemical action could take place between the iron and the lead when it was employed to insulate the two materials. He threw it out as a practical suggestion which he was intending to try himself. It was well to keep such new materials before one, and he could imagine a spire of steel or ferro-concrete where the metal would crop up towards the surface, and where it would not be wise to use lead without some intervening material. The necessity of protecting lead against the action of oak was never more demonstrated, if he remembered rightly, than in the new lantern over the crossing of Ely Cathedral, because in a short time after that was put up the structure was so disintegrated that it had to be practically re-erected.

Mr. E. W. Hudson said he had been specially interested in the remarks referring to the crocketed work and ornamental work on spires, and trusted that they would be illustrated, for they were much less known than the twisting and ordinary broach spires. He was particularly interested in that of East Harling, and in the drawing of Sir Charles Nicholson it threw a light on what had long been a problem to him. Stowe in his account of the House of the Knights Hospitallers in Clerkenwell described the tower and spire as being "a great ornament to the City, the like of which he had never seen; graven, gilded, and enamelled." It puzzled him for a long time as to what the material could be, but when he saw the drawing of Sir Charles Nicholson and the inlay which Mr. Troup had made it struck him that they had the explanation now. With regard to steel covered with lead, that might be a very honest structure, but he hoped they would never see a repetition of what they saw at Rouen and at Cologne, where cast-iron was used. Mr. Lethaby's work had been mentioned, and in his book they had some views of fonts and of other things which were not supposed to be fonts—they were small lead vessels, the use of which apparently was not known. Perhaps Mr. Troup might remember them, and be able to tell what they were. When the Templars' goods were seized in the Temple in 1307 by order of the King, amongst the inventory of goods were items of lead—"one lead, 40s.; one lead, 30s.; and one lead, 10s." He had never been able to make out what they could be. They could hardly be ingots, but it struck him they might be something in the nature of cisterns or tanks, because 40s. was a considerable sum in those days, and "odd pieces" at 8d. each were noted. They were found in the brewery, and whether lead was used for such purposes in a brewery would be interesting to know. In interments also they had instances where an abbot had been buried, and lead been used not only for the ring, but also for the patten, chalice, and mitre, and these were covered with gilt and colour in a very elaborate way. This was a novel way of using lead, and the colouring and enamelling seemed noticeable as a way of cheaply honouring the dead.

The Chairman said the practical details which Mr. Troup had given them were of great value, and the beautiful enamelling he had shown was very interesting. The art had almost died, but he hoped it might revive again, because it contained in itself a permanent decoration far better than many of the enamels which they had seen, like that of the drinking fountain of Westminster. Mr. Weaver's paper was most wittily delivered, and was a very poetic paper dealing with a very poetic subject. As the paper was confined to spires, he naturally did not refer to the many other ways in which leadwork had been used for decorative treatment. He was aware that it was a moot question whether the Palace of None-Such had its decoration in leadwork or plaster. They knew that some of the beautiful lead cisterns were quite works of art, and displayed an architectural or craftsmanship knowledge on the part of the plumber which was highly commendable. With reference to the use of lead and steel, there must be some disconnecting material, or they would get galvanic corrosion, which would probably create very grave evils. Personally, he generally put felt between the materials, which was a very safe non-conductor, and he did the same when using oak. Reference had been made to Chesterfield. They had heard of eccentric architects, but he could not imagine any architect wanting to design Chesterfield spire in the way they saw it to-day. It was, of course, interesting, because it was so very absurd and because it stood without falling.

The vote of thanks having been passed,

Mr. Troup said that, with regard to Mr. Lanchester's question as to tinning, he had a description from an old French book, which ran as follows:—"When the plumbers wish to tin sheets of lead they have a tinning furnace full of hot charcoal, on each side of which a man stands holding up and heating sheets of lead. Leaves of tin are laid over these, and as the sheets get hot and the tin melts the tinning is accomplished by rubbing and spreading it over the surface with tow and resin." This was from a XVIIth century book, and the process was really like tinning a saucepan. Burges also gave a description of how tinning was done when the lead was *in situ*, because it was not necessary that the work should be done in the workshop. There was another way in which it could be tinned ornamentally. This was to cover the lead with plumbers' soil and scratch out the parts they wanted to tin. It could also be done by laying brown paper cut out in a pattern over the lead. Then they applied the tin to the lead, and it adhered only to the parts not covered with the brown paper. That was the way in which some part of the roof of Hatfield House had been ornamented, so said Mr. Lethaby. There was no great difficulty in fixing lead upon other things besides woodwork. Of course, the milled lead was lighter than the old cast lead, which could be hung to pieces of iron. They frequently supported lead with iron hooks, and without the protection of felt or anything else. So long as there was no leakage so that water came in there was no great harm, because the galvanic action did not take place when the two metals were dry, and, of course, where the wet did come in felt would not be much good. When oak was used it was almost impossible to keep the acid from the lead. They could paint it and varnish it, but the acid came through almost anything, and seemed to seek for the lead. He did not think there was any way of getting over that difficulty except by washing the acid out of the oak before using it. He should think that uralite would be a very good basis for

lead, but was probably unnecessary in cast lead, because cast lead was so much stouter, and would hang on a framework instead of having to be supported all over the roof. In French cathedrals the boarding was not continuous, and this had the further advantage of allowing ventilation. With modern lead it would probably sag unless continuously supported. As regarded ironwork as a framework for roofs, the whole of the roof of Chartres Cathedral was ironwork, and the sheets simply hung between the ribs of iron. It was not steel. The Rouen spire referred to was not lead at all, but was simply a skeleton of cast iron, and could easily be covered with lead if there was any desire to do so. As to the question of lead for tanks in breweries, he thought it would be rather dangerous to use lead, because the acids from the materials used in brewing would attack lead. The French Government had a regulation which prohibited the employment of more than one-third lead in pewter, so as to avoid the possibility of lead poisoning.

Mr. Weaver said that, as to the twisted spire at Chesterfield, he did not think that anyone could possibly desire to perpetrate such a gigantic practical joke, but, as a matter of fact, Chesterfield was not the only spire that twisted, for there was a little spire at Walsingham, in Norfolk, which also had a twist. He did not know what the timber work at Chesterfield was. As to the intermediate material between steel and lead, he thought uralite would do, and, indeed, there were plenty of materials which would do. The main thing was that the material should not burn. He quite appreciated what Mr. Townsend had said of Mr. Nesfield, but what he appreciated about Mr. Lethaby was that he was the only person who had written a book about leadwork. Mr. Lethaby in his book referred to a vessel, which he called Anglo-Saxon, which had triangular forms on it and two iron handles. He did not think this was a font, and it was probably a large salt of a monastery. There was a small vessel in Gloucester Cathedral, and he could not imagine what it could be. It was too large to be a vessel for the ablution of Mass, but it might possibly be a stoup. As to the question of interments, there were a large number of pattens and chalices of lead, but he did not know of a mitre before; they were simply put in in the ordinary way of swindling the dead. They could make a patten or chalice of lead and gild it, and a long way off no one could tell it was not gold, and so they got the benefit of being generous without the cost. From the very earliest Egyptian times these votive offerings had invariably been swindles. There had been very many lead pectoral crosses found, and in the times of the Black Death, when people died rapidly, everyone had a pectoral cross, which were nearly always of lead. When they were dealing with the site of Christ's Hospital recently Mr. Hilton Price came on a gigantic find of lead crosses, none of which were in the least bit decorated. They were simply pieces of lead chopped out of a sheet. The friars doubtless died in large numbers, and the pectoral cross was simply chopped out roughly, without the faintest attempt to ornament.

The Chairman announced that the next meeting would be held on April 2, when Mr. W. Aumonier and Mr. A. W. Martyn would read papers on "Wood-carving."

BRITISH SCHOOL AT ROME.

THE third open meeting of the above school was held on March 12, and was attended by a considerable number of British residents in Rome and foreign scholars. Professor Gardner opened the proceedings with a paper upon "Copies of Statues on Coins." He began by pointing out the value of the representations of works of sculpture upon coins, and noticing the conventions which are found in them, and which must be taken into account. He proceeded to illustrate his remarks by reference to two particular statues—the Artemis Laphria at Patræ and the Themistocles at Magnesia. The former was mentioned by Pausanias as having been brought to Patræ from Calydon by Augustus after his depopulation of the latter city, and as being the work of two Naupactians—Menæchmus and Soidas. Upon a series of coins of Patræ of the imperial class reaching from Nero to Caracalla was an almost identical figure of Artemis, sometimes vouched for by the inscription "Diana Laphria," but unmistakable in itself. That the coin showed us a copy of the cutter's statue was in itself almost certain, and the association with it on one coin of the well-known Aphrodite of the Acropolis of Corinth left practically no doubt on the point. It had been objected that the statue as represented on the coins was of a later period than that to which belonged the sculptors to whom Pausanias attributed it; but the objection probably rested upon a misunderstanding, and both sculptors and statue might be fairly assigned to the middle of the Vth century B.C.

The statue of Themistocles, set up soon after his death in the market-place of Magnesia, in Ionia, was represented on a coin struck in the reign of Antoninus Pius. He is seen nude, standing to the left, with a patera in his right hand and a sheathed sword in his left. Before the hero is a burning altar, in front of which lies a slain bull. It seemed probable that an actual copy of the statue might be recognised in a figure now in the Glyptothek at Munich, which was formerly in the Villa Albani, and which generally bears the name of "A Heroic King," though attempts had been made to see in it a Zeus —wrongly, in all probability, inasmuch as a Zeus with short hair (which this figure has) would be most unusual in the first half of the Vth century B.C., to which the original of this figure must be assigned. In pose and type the Munich statue and the figure on the coin correspond fairly closely; some archæologists maintained that the sheath in the former was a modern restoration, but, even if this was so, it was difficult to see why the restorer (who could not have known or used the coin) should have introduced it unless he had some authority to go by; and in period the two were contemporaneous, which gave the identification a high degree of probability.

The second paper was read by Mr. A. J. B. Wace, Librarian of the School, on "Some Late Roman Historical Reliefs." He first considered the six late reliefs that form the frieze of the Arch of Constantine; these he divided into two sets, which were distinguished by some slight stylistic differences, and by the fact that in the first group of three the original head of the Emperor had been carefully chiselled away, so as to be replaced by another. Of the other three, two showed no Emperor at all, and in the third the Emperor's head, though badly damaged, had never been altered.

The first group he attributed to Diocletian, who was the last Emperor to celebrate a triumph (303 A.D.), and whose building activity in Rome was considerable, and the scenes on these reliefs—a triumphal procession, a *congiarium*, and a speech from the Rostra—were, or could be, all connected with a triumph. Of the other three reliefs, one probably represented the defeat of Maxentius at the Pons Milvius, and another the battle of Verona—Constantine's two decisive victories in the Italian campaign of 312 A.D. The third, a conventional triumph, might have been made as a pendant to the corresponding relief of the first group. These reliefs were thus to be considered Constantinian.

He next dealt with the sculptured base of the obelisk of Theodosius at Constantinople. This base consists of two large marble blocks, the lower one cut so as to form a smaller cube resting on a larger one. This block was orginally intended to carry the obelisk, as shown by the representations on two of its sides of the transport and erection of the obelisk itself; but from the Greek and Latin inscriptions on its other two sides it was plain that the obelisk, though brought to Constantinople some time before, was erected for the first time only under Theodosius. The upper cube of this block, which was decorated merely with grooved ornamentation, has had its corners cut away and replaced by blocks of granite set with mortar. From the dowel holes visible on the upper surface of the lower cube it was plain that the granite blocks and the grooved ornamentation, which had been much cut away, were covered by facing slabs of marble.

The upper block of the base carries the four bronze blocks on which the obelisk actually stands. Directly underneath one of these bronze blocks the corner has been repaired, clearly after the block was first carved, since, though some of the representation was continued on the restoration, the rest was not. Thus it might be assumed that this upper block was not originally intended as a base for the obelisk, and was already sculptured when put into its present position, being damaged in the process. It was necessary, in order to protect the reliefs upon it, to lift it by clamps under its four bottom corners, and to allow of the removal of these when the upper block was dropped into position on the lower the four corners of the upper cube of the lower block were cut away. This assumption, that the two blocks of the base were not made for one another, was strengthened by the fact that on two sides the upper block overhung the lower. We had therefore to consider the reliefs on the upper block at least as pre-Theodosian. In the scenes which represent the Emperor and his family in the Hippodrome the figures were usually identified as Theodosius, the Empress Flaccilla, and his sons Arcadius and Honorius. But the figure called Flaccilla wore the same dress as the other three, and had no feminine characteristics. Therefore the conclusion that the block is pre-Theodosian was strengthened, and we might take the four male figures to represent Constantine and his three sons; and the style of the heads on these reliefs agreed very well indeed with the extant portraits of the Constantinian period.

THE FURTHER STRAND IMPROVEMENT SCHEME.

A MEETING of signatories to the memorial to be presented to the London County Council for a review of the planning of the Strand between St. Martin-le-Strand and St. Clement Danes was held at Burlington House on Monday, Sir Edward Poynter, President of the Royal Academy, presiding.

Mr. Mark H. Judge, hon. secretary of the Further Strand Improvement Committee, said that the County Council were about to consider a scheme for dealing with the Aldwych site, and if the recommendations of the Improvement Committee of the Council were carried it would be impossible to adopt the proposals which the signatories to the memorial advocated. It was of the greatest importance, therefore, that they should make another attempt to get the Council to revise the frontage line, and to set back the line of the Strand on the north side between the two churches, so that the roadway may have its natural course direct to and from the Courts of Justice.

The Chairman stated that the reason which had actuated the Royal Academy in taking the lead in the matter was that previous memorials to the County Council seemed to have received but scant attention. As strong representations from individual members of the Academy had been set aside, it seemed but right that the Academy should take action in its corporate capacity, and he was in a position to say that the memorial had been unanimously adopted as expressing the views of all the members. He hoped, therefore, that this expression of the Royal Academy's sympathy with the memorial might finally have some effect on the decision of the Council. He believed that if the County Council could be convinced that there was a public advantage to be gained outside the financial considerations, they would be willing to provide for a noble thoroughfare in the most conspicuous part of the metropolis. After the handsome way in which the County Council had met him in the matter of preserving the view from Richmond Hill, he could not believe that that body were oblivious to considerations of beauty or the desires of the public. This was quite as important a matter as the Richmond Hill view, and he wanted the County Council to feel that there were questions of economy that might rightly be subordinated to higher considerations.

The Earl of Plymouth moved:—

"That, in the opinion of this meeting, the memorial of the Further Strand Improvement Committee, the Royal Academy of Arts, and other corporate bodies makes a clear case against the plan adopted for the building land between Aldwych and the Strand, and that the London County Council be requested to receive a deputation charged with the duty of presenting the memorial."

He said he feared there were still people who held that æsthetic considerations were not to be taken seriously when they went beyond utilitarian interests, but they should recollect that they were now dealing with a scheme of London improvement larger than

D

any which had been undertaken since the Great Fire of 1666, and that the untold millions of people of the years to come would assuredly hold the present generation responsible for any blot which might impair the dignity and architectural effect of the Strand. They were accustomed to look with shame and some contempt on the lost opportunities and shortsightedness of their predecessors; therefore, surely they would not be led into committing the grave error of failing to enter a very earnest and solemn protest in a matter of this kind before it was too late. They had been told that to adopt the prayer of the memorial would mean a loss to the ratepayers of a sum which had been put as high as 350,000*l.*, although he did not believe it, but he did believe that the ratepayers in the future would suffer no serious damage by the laying out of a great thoroughfare from Buckingham Palace to St. Paul's on lines sufficiently large, as befitted the greatest city in the world.

Mr. Harold Cox, M.P., in seconding the motion, said they had an opportunity of doing something to-day which would be the pride of Londoners for all time.

Mr. Frederick Harrison stated that he was the Chairman of the Improvements Committee of the London County Council which in 1892 brought up the original Kingsway scheme, and he knew that in those days the Council never contemplated any narrowing of the Strand, as was now proposed. If the Council adhered to their plan it would wantonly mar the grand effect of the perspective view from east to west.

Sir Aston Webb, R.A., Sir William Richmond, R.A., and Mr. Hamo Thornycroft, R.A., cordially supported the resolution, which was carried unanimously, and, on the motion of Sir Henry W. Lawrence, seconded by Sir William Chance, the President and Council of the Royal Academy were cordially thanked for the support they were giving to the movement.

The memorial has been signed by the President and Council of the Royal Academy, by the President of the Council of the Institute of Bankers, by the President and Council of the Civil and Mechanical Engineers' Society, by the President and Secretary of the Council of the Surveyors' Institution, by the Chairman and Secretary of the Arts Club, by representatives of the metropolitan borough councils of Bermondsey and Fulham, the Civil and Mechanical Engineers' Society, the Fabian Society, the Clinical Research Association, and by a long list of peers, members of Parliament, artists, men of science, and others who have joined the Further Strand Improvement Committee.

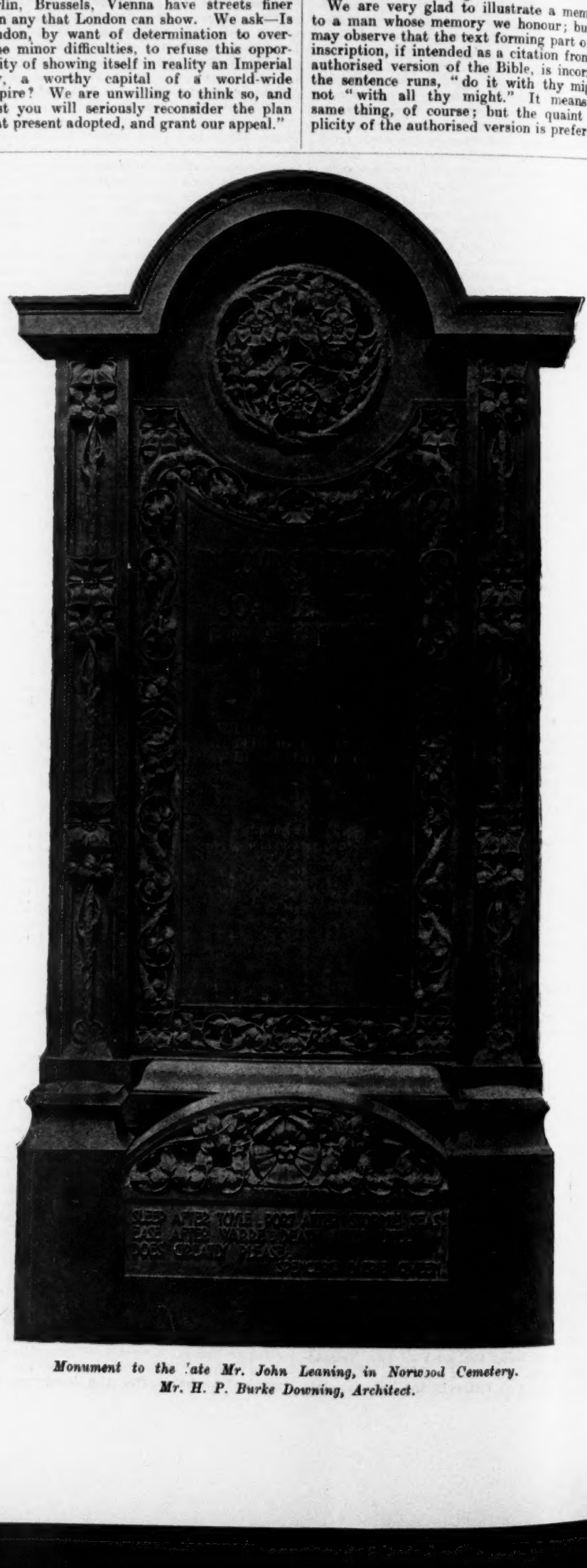
The memorialists say that they feel that the persistent and widespread condemnation of the shape which has been given to the portion of the Strand between the churches of St. Mary-le-Strand and St. Clement Danes makes it their duty to bring the subject again before the Council. They urge that the representations of the Royal Academy have hardly received the consideration they deserved, and they state that the Gladstone memorial, now erected at its allotted point, intensifies the need of the alteration for which appeal is made. This monument, it is pointed out, it so placed that it makes the eastern end of the site between Aldwych and the Strand still more awkward to eastward traffic. The memorial proceeds:—"To state concisely our objection to the plan adopted, it is that, between the two churches, the north side of the Strand, instead of being planned so as to give the roadway its natural course direct to the Courts of Justice, deviates some 60 ft. towards the south, thus forming a barrier between the portions of the Strand east and west thereof. Our reasons are that (1) we consider the plan is in itself an ugly, distorted figure; (2) when buildings are erected on the site, these will obliterate from the west the view of the Courts of Justice and the church of St. Clement Danes, and from the east that of the church of St. Mary-le-Strand; (3) being at an angle encroaching upon the church of St. Mary-le-Strand, the buildings will mar the beautiful aspect of that church from wheresoever viewed; (4) the angles of the roadway are awkward and dangerous to traffic. We submit, therefore, that the matter should be considered from the points of view not only of what is for the moment financially desirable, but also of what is befitting the dignity of the capital of our Empire." The memorialists further contend that the alteration is essential, and, moreover, would materially enhance the value of the frontage, thus to some extent compensating for the reduction of building area. The memorial concludes:—"As pointed out in the report of the Royal Commission on London Traffic, Paris, New York, Washington, Berlin, Brussels, Vienna have streets finer than any that London can show. We ask—Is London, by want of determination to overcome minor difficulties, to refuse this opportunity of showing itself in reality an Imperial city, a worthy capital of a world-wide Empire? We are unwilling to think so, and trust you will seriously reconsider the plan as at present adopted, and grant our appeal."

MONUMENT TO THE LATE MR. LEANING.

THE monument here illustrated, to the memory of the late Mr. John Leaning, has been put up in Norwood cemetery.

It is in one block of Hopton Wood stone, and has been executed by Mr. Nathaniel Hitch from the design and details by Mr. H. P. Burke Downing.

We are very glad to illustrate a memorial to a man whose memory we honour; but we may observe that the text forming part of the inscription, if intended as a citation from the authorised version of the Bible, is incorrect; the sentence runs, "do it with thy might," not "with all thy might." It means the same thing, of course; but the quaint simplicity of the authorised version is preferable.



Monument to the late Mr. John Leaning, in Norwood Cemetery. Mr. H. P. Burke Downing, Architect.

CARPENTERS' HALL LECTURES:

THE YEOMAN'S HOUSE IN ENGLAND.

THE fifth of the present series of free lectures on matters connected with building arranged by the Carpenters' Company was given on Thursday last week at Carpenters' Hall, London-wall, by Mr. E. Guy Dawber, who took for his subject "The Yeoman's House in England."

In some preliminary remarks, the lecturer said he would take the opportunity of thanking Mr. Batsford, the publisher of the series of volumes on old cottages and farmhouses, for his kindness in lending the photographs and for the use of his books for the occasion. Proceeding, he said that architecture was so interwoven with the life and history of a people in all the great changes that nations underwent that it was expressed in the buildings of their time. In the Middle Ages and down to the XVIIIth century architecture, or building, as it is better called, was always influenced by local conditions, and the character of the work was much the same all over the country. It was really a product of evolution, growing out of the inherited knowledge of the wants the builders had to satisfy and the natural material at their disposal, and the first need was shelter. The original classes into which primitive man was divided were hunters, shepherds, and agriculturalists, and the buildings which each would require were characterised by their several occupations.

The lecturer described the sort of dwellings used by these classes—i.e., caves and rocks, tents, and the hut—and he gave a brief account of the gradual evolution of the house from prehistoric times. The central room or hall was the keynote to the plans of houses, both great and small, in this country for centuries, and if we remembered this fact it was easy to trace the development of the plan throughout the Middle Ages and down to the XVIIth century. Up to the Reformation, or dissolution of the monasteries in Henry VIII.'s reign, most of the workers on the land were accommodated in convent buildings or beneath the roofs of the great land owners, whilst the numerous hospitals or bede-houses afforded shelter for a number more, and small individual houses were practically unknown. But when the change of ownership came at the Reformation an immense impetus was given to agriculture, and the building of houses, both great and small, became a necessity. Houses were no longer built for defence, and it was from this period—about 1550—that the greater part of the timber and stone houses and cottages in England were constructed.

The architecture of the larger houses lay in a category somewhat by itself, and doubtless owed much to foreign influence and execution, so that it must be amongst the smaller and more homely buildings standing modestly by the wayside that we must look to find work conceived and carried out by native hands, and the period in which we found the most representative types would be in the years between 1580 and 1680. A yeoman as we understand it to-day was a freeholder, a man who owned and usually himself cultivated a small landed property, and thus had an interest and stake in the welfare of the country. We must recollect that in those days houses were handed on from father to son, and were often occupied for generations by the same families. Perhaps we did not sufficiently realise that it was this old architecture that had made our country so picturesque and had added so largely to the quiet beauty of our villages and hamlets, for the forms and colours of old English cottages and farmhouses were almost always pleasing in themselves, and in harmony with their surroundings. Again, the geological formations of this country not only gave a distinctive character to the districts which they compose, but also to the buildings themselves, and where we found the materials that nature provided used there, without doubt did we see the most beautiful architecture, because it was the most appropriate. The chief feature of building generally in the olden times was suitability to its purpose and the use that was invariably made of the local materials at hand.

The lecturer said he should endeavour to show how much the materials of which the houses were built influenced their construction and design. Of course, we must recollect that the builders had none of the difficulties to contend with that are ever present to-day. Drainage and sanitation were practically unknown as we understood them; water-supply and the consequent introduction of pipes inside the house, together with the complications of modern requirements, were non-existent, so that when examined in detail they were found to be simple, both in plan and arrangement. The houses were mostly placed in such positions as would shelter them from exposure to the weather and give ready access to such roads as then existed. This, however, was by no means always the case. Apparently no attention was paid to the question of aspect, or as to whether the position commanded good views. No doubt a great deal of the charm of these old houses was due to the fact that they were nearly always self-contained, for the first thing that struck us was the absolute simplicity of the plans. The bulk of the larger ones had now been converted into two or more separate dwellings, and, though many of these later alterations appeared at the first glance to have changed the original plan, it was easy to reconstruct it. As single houses they consisted of two or three rooms on the ground floor, with one—the living-room—generally larger than the others, the most usual plan being practically a continuation of the old mediæval one—an oblong living or common-room in the centre, with offices or chambers at either end or forming wings; sometimes the wing was built at one end only, but more frequently the plan was symmetrical. A beautiful, though much mutilated, example still remains in the manor-house at Pattenden, Kent, which dates from the early part of the XVIth century, having been built for the standard-bearer of Henry VIII. Beyond the actual rooms themselves there was nothing—no store cupboards or conveniences of any kind—and everything was contained within the four outer walls. The smaller houses generally had but one outer door, but as they grew in size and importance two, and sometimes three doors were not unusual, and it was only since these houses had been converted into cottages that other doors and windows had been inserted, such as were never found in the original buildings. In the farmhouse at Rissington, in Oxfordshire, this was clearly seen.

The houses were always planned one room in thickness, so that they could be roofed in in a single span, and so avoid any complications with internal lead gutters and flats. When more accommodation was needed they were at first lengthened, then made L, E, or H shaped, with a central block and projecting wings, but, however large the house, always retaining the single-span roof. The stairs generally ascended in the middle of the house directly from one or other of the living-rooms, and frequently by the fireplace, and contained in as small a space as possible. They were often circular in plan, and in some of the oldest houses were in stone, with a central post or newel similar to those in a church tower—an instance of the manner in which old traditions lingered in country places. Oak was the other material used, with a series of winders round a centre post, and generally cramped and awkward to get up and down. Sometimes these staircases were in turrets projecting from the main building, finished at the top with a conical roof.

The two great features of domestic architecture, more particularly in a climate like our own, were the roof and the fireplace. Most of the fireplaces, those in the living-rooms especially, were very large, frequently 6 ft. and upwards in width; they were not high—some 4 ft. or 5 ft.—with the head formed either of stone (as at Plas Mawr, in Conway, and Boswick Hall, in Westmorland) or spanned with a plain lintel of oak or arched in bricks. When the fireplaces were large on one or both sides seats were often arranged just wide enough for a person to sit down comfortably. Some few inches up on each side there were places hollowed out to take the elbows, or else to stand a cup or mug on. Sometimes cupboards were fitted in, and occasionally there were small windows to light the ingle. The chimneys were quite one of the most important elements in the external effect of many of the houses. The liberal use of materials in their construction, the simple yet bold way in which they spring in rich, clustering shafts from the ridges or gable ends, was always an attractive feature, and one that greatly enhanced their beauty. The variety of plan adopted was almost endless, and the utmost ingenuity seemed to have been exerted in their arrangement. They were placed generally at either end of the building, or they rise in a mass from the centre of the roof, and as if the old builders disliked too much uniformity. When the latter plan was adopted we notice various projections and setting forward, many without apparent reason, except the love of novelty and change, as at Eastbourne, near Midhurst.

In those parts of Sussex and Kent where stone was quarried many of the cottages were built of it, but here, as in other districts of England, the builders were confronted with the difficulty of carrying up the stacks above the roof line in stone. The nature of the stone was such that it did not lend itself to the customary separate shafts, such as were seen throughout the Cotswold and Northampton districts, formed of thin slabs set on edge one over the other. To build them in the ordinary stone walling would have made them too cumbrous and bulky, so before leaving the roof the stone was abandoned and brick unreservedly used as a substitute. Hence we frequently saw in this part of the country the pleasing combination of the base of the stack, which generally projected from the face of the wall, being of stone, and the shafts above being in brick, as at Eashing Park, Ford Mill, near Wrotham, Penshurst, Wickhambreaux, and Bean Lodge Farm, near Petworth, and Craven Arms. Now, in the stone districts the chimneys were always placed centrally over the ridge or on the apex of the gables at either end (as at Broadway), or when the stacks were at the side of the building then one smaller roofs connecting them with the main one. The base of the chimney was invariably square until it cleared the roof, then the flues were built separately, either square or diagonally, in clusters of two, three, or four, always made of slabs of stone (as at Medford House, in Gloucestershire), about 3 in. or 4 in. thick and 8 in. or 10 in. deep, standing on edge and breaking joint over each other, and tied together at the top by a moulded cap of some simple section, as at the court-house at Painswick, in Gloucestershire. The ingenious way in which these chimneys were managed, whether of stone or plain, unmoulded bricks, always excited a feeling of admiration, for, simple as they were, they possessed a breadth and sense of proportion sadly lacking in cottage chimneys of the present day. It was, however, in the arrangement of the roofs that these old builders excelled, always bold in outline, simple in plan and arrangement, and generally unbroken in their surface and treatment; they sheltered the whole house, and conveyed at once a kindly feeling of homeliness. In the tiled roofs of Kent and Surrey hips perhaps were more frequently met with than gables, and hardly a roof seemed complete without them, but directly we got into the districts where stone-walling and mullioned windows were used gables were more noticeable. If we analysed any of these roofs in order to discover what constituted their charm we found that they resolved themselves into very simple forms, but the masterly way in which in almost every instance the grouping and disposal of the gables, chimneys, and dormers was managed was worthy of our admiration. Dealing first with the stone buildings, the roofs were nearly always treated in the same way, having a slope of about 55 deg., and being hung with stone slates (the only material available) graduated in thickness and size from the eaves to the ridge, and crowned on the top with a stone cresting. In the example from Painswick we saw the effect of material upon design and construction, and how these builders realised that one was dependent on the other. The nature of the stone of which the slates were made—in the Cotswolds, at any rate—limited them to certain sizes, so that the stone roofs of flatter pitch covered with large and heavy slates found in Sussex and the north of England were quite unknown here.

If the angle of the roofs was flattened the slates would have to be larger, otherwise they would not keep the wet out, so, after finding the pitch at which they had least strain on the pins and were most weather-proof, the old slaters never varied it. The valleys were formed of the same slates, in

a wide sweep with no hard line of demarcation where the roofs intersect, all laid in regular formation and ranging with the ordinary slating, as shown in Callowell Farm, near Stroud. Owing, doubtless, to the difficulty of getting lead in these country villages the builders did without it, and their houses, as mentioned before, were always roofed in a single span, and no lead gutters or flats were needed. Hips or any cutting or mitring of the slates were absolutely unknown in a genuine stone-roofed house, and we, therefore, invariably found the gables with the slates carried out over them, as at Back Edge, in Gloucestershire, or finished with a coping, as in Moor Hall, Stroud. The old craftsmen could do almost anything with their stone slates; the clever way in which the outside overs were roofed, or over the circular outside staircases with pointed roofs, and again in the beautiful dovecots, of which so many still remain scattered about the country, was truly remarkable. The dovecot from near Cirencester was a very typical example. In Cheshire and Lancashire and Yorkshire, and parts of Sussex and Somersetshire, where the stone slates were very large and heavy, the pitch of the roof was flattened, for it would be impossible to cover with heavy stone slates steeply sloping slides, where all the drag and strain would be on the pegs and laths. Doubtless some of the roofs of the houses in the south-east of England which were now covered with red tiles and had such a beautiful effect were once hung with stone, as many of the buildings were of earlier date than the roofs.

Tiles were not generally used in England until the XVIIth century, owing to the scarcity of coal and the difficulty of burning them. For the same reason bricks were not employed extensively for building before Henry VIII.'s reign, though, of course, the art of brick-making, so commonly used by the Romans, was never lost in England. Formerly bricks were much thinner than they are at present, and there was little to distinguish them from tiles. The old red tiles we found on the roofs of these buildings were thicker and more unevenly burnt than our modern ones of to-day; they were, of course, all made by hand, and the holes for the pegs or nails were not so accurately placed, and, being hung on oak riven laths instead of sawn straight ones, the irregularity of the tiling and the texture of the surface produced a softness and delicate play of light and shade that was very pleasing. This effect could be seen on the roof of the cottage at Mayfield. Thatched roofs, which were probably a survival of the earliest form of roof covering, were frequently met with, and here the hips treatment was even more prevalent than with the tiled ones. There was no doubt that these old houses gathered a great deal of their charm and simple picturesqueness from the fact that the roofs were so unbroken in their surface and treatment, and though the little use to which the space inside was devoted and the apparent wastefulness of their construction would appal the modern builder, yet it was this evident disregard of economy that made them so effective.

Quite apart from anything else a roof of high pitch gave a character and dignity to the building it covered which was distinctly pleasing. The roofs of all these old houses were so satisfactory as they seemed to grow naturally from the walls below, and whether of stone, tile, or thatch, being of the local materials made them seem part of the actual landscape.

Timber-built Houses.

As to timber-built houses, broadly speaking, as they resembled each other to a certain degree in plan and elevation, so they did in their construction, which was simple in the extreme. The author then gave the following description of these houses:—

"The plan was first set out, and a base or foundation-wall built, generally of brick or stone, high enough to keep the wood all well above the ground, as at Boughton, in Kent. Into this sill-piece heavy story-posts of timber were fixed upright about 7 ft. or 8 ft. apart, those at the angles being larger and formed of the butt of a tree placed root upwards, with the top part curving diagonally outwards to carry the angle-posts of the upper story, as shown in the view of Stone Hill Farm, Chiddingly, where also the typical Sussex stone slates can be seen. Upon these main posts beams were laid across the building, projecting forward some 18 in. in front of the framing below; into these beams others were connected longitudinally, and to these again the floor joists were tenoned, projecting the same distance as the main beams. The framing of the upper story then followed that of the ground floor, excepting that the plate or sill was now laid on the ends of the overhanging timbers. In the XVIth century the ends of the joists were often covered with a richly-moulded (and carved, as at Lenham) fascia; but later this was abandoned, and the ends of the joists were merely rounded off. The projecting stories of these timber houses, which, with their quaint and decorated fronts and many gables are so beautiful, were not born of a mere freak or an artist's fancy. They were copied from the town houses, and these overhanging stories were intended for use—namely, to give shelter from the sun or rain to the stalls and books and to the goods displayed in the streets: and though there was no actual need in the country for such projections, the custom was adopted until it became almost traditional. The house in its first stage was a mere timber skeleton or "carcass," as it was then called, and until the framing was well advanced had to be staged or propped up from the outside—the slots to receive these stays are still showing in the larger timbers of many of the houses. The spaces between these main uprights were then filled with windows or timber framing, the latter generally about 8 in. or 9 in. apart, the closeness of the timbering being an indication of early work, and it was not until later that they were set further apart and curved and shaped braces introduced. Though the general character and appearance of these Kent and Sussex houses bears some resemblance to those of Shropshire and Cheshire and the West of England, the elaborate panels, filled with curved braces and cusping, so typical of the latter districts, are seldom seen in Kent, though there is a somewhat isolated example at Mayfield, in Sussex. These were contrived by using the bent and twisted pieces of wood obtained from the smaller branches and fitting them into the panels formed of the upright and cross-rails. It has been suggested that the prevalence of this kind of ornament was due to the shape the trees assumed from the force of the wind which is so frequent in the West of England, and which bent and distorted the trees, and so supplied many more crooked than straight branches. I have some typical examples from Little Moreton Hall, Cheshire. These houses were chiefly built of oak, which generally shrinks, and, as their construction depends in great measure upon the security of their mortises and tenons, when the joints shrank apart or decayed and the buildings settled they were, in order to keep out the weather, either plastered all over on the outside, hung with tiles, or covered with deal boarding—indeed, very many of the tile-hung houses one sees throughout Sussex are the old XVIth century timber-framed ones in a new shell, as at Goudhurst, in Kent. The windows, as a rule, in the timber houses were small, with moulded frames and mullions, and filled with lead lattice-glazing. Sometimes they were treated as oriels, swung forwards on richly-moulded sills, supported by cut and shaped brackets. An effective arrangement was to place a bay window carried out on the first floor only, as at Chiddingstone, but more frequently taken up from the ground and under a gable which projected forward and overhung it, as at Beckley. The large boards and finials to these gables were always decoratively treated, and many still remain. At first they were merely stout boards cusped or shaped at the edges, and later ornamented with perforated tracery and carving, as at Eynsford and Cranbrook; a beautiful example is still to be seen in the the High-street at Burford, in Oxfordshire."

The Stone Districts.

Turning again to the stone districts we found the walls of the houses always built of stone never less than 18 in., and often considerably more than 2 ft. in thickness; they were built of either rubble in thin layers, or in deeper courses of dressed stone, or in larger blocks of dressed stone, or in larger blocks of dressed stone, the character of the walling depending in great measure upon the way in which the stone came from the quarry. In Wales and Westmorland the nature of the stone was reflected in the walling, as at Plas Mawr and Ambleside.

In the XVIIth century the employment of the stone lintel was universal, and one was struck by the almost entire absence of the arch in these buildings—externally the openings were never made wider than the stone would carry, and stout oak beams were laid across the door and window opening inside. The four-centred door head out of one stone was the commonest treatment, at first steep in outline as at Laverton, then shallower, until eventually it became the flat lintel. Occasionally the doorways were sheltered with a projecting hood, on moulded brackets as at Chalford Hill, but in the stone districts a point to be noticed was the absence of porches so common in timbered houses. The doorway, or entrance, had always been the centre of attraction, and that upon which the best workmanship was most often found, for if there were no ornament anywhere else it was generally here that some effort was made. It was always in the doorways, fireplaces, and memorial tombs in the churches that the old builders tried to exercise their ingenuity and originality, and where one would notice the influence of change of style and fashion as at the Warren Farm. The proportion of the doorway also greatly affected its character, a wide and low opening conveying a sense of welcome and comfort that was seldom obtained by a tall and narrow one.

The windows, again, were always stone mullioned, filled with lead-latticed panes and wrought-iron casements, and, whether in stone or wood, were nearly always treated in the same way, 12 in. to 16 in. wide between the mullions, and in the small houses with seldom more than one light high. The number of lights in nearly every instance diminished in each succeeding story. On the ground floor the windows had four or sometimes six lights, with a heavier central mullion, the next story would have three, and in the gable would be two. It was the invariable practice to lessen the number of lights as the windows ascend into the gables. The reason for this might have been owing to the dearness of glass in the XVIth and XVIIth centuries, which in these small houses would doubtless govern the size of the windows, those in the living-rooms being generally the largest. Indeed, the smaller the window, as a rule, the older the house. Before the time of Henry VIII. glass windows were rare except in churches and important houses, and when it eventually became cheaper the fashion arose of making the windows as numerous and large as possible.

The symmetrical disposition and squareness of the plans and the way in which they were roofed enabled the windows to be easily arranged to come centrally under a gable in every case, as at Tocknells and Whittington, a treatment also met with in the timber and brick built houses.

In the stone houses the windows were always placed on the outer face of the wall, so that inside the deep recess gave that delightful sense of comfort and warmth only obtainable when thick walls were used. Bay windows were not of very frequent occurrence in these small houses, but in the towns and villages they were sometimes used with very happy effect, as at Duddington, in Northants. Where the frontage to the street was very narrow the entrance was placed in the centre with a bay window on either side, terminating in gables above, as at the Swan Inn at Lechdale, in Wilts, and at Campden, in Gloucestershire, where we find an almost similar treatment, but without the bay windows. No description of the windows would be complete without speaking of the dormers, the most characteristic feature of these stone houses. Their origin arose in the following manner:—The buildings were generally roofed about 12 ft. or 15 ft. above the ground, or some 4 ft. above the bedroom floor. This did not give sufficient height for the windows to be placed under the eaves, and, as the bedrooms were always constructed partly in the roof, it was necessary to carry

up the side wall and form smaller gables with windows in them which thus become dormers, as at Saintbury. The lead latticed glazing of all these houses forms quite an integral part of their construction, and the mullioned window without its accompanying small panes of glass was but a sorry sight.

In the early houses we found the panes based upon a variation of the diamond and the square, sometimes very small and intricate, but always such as the village glazier could cut and put together. Towards the close of the XVIIth century the rectangular oblong panes became very popular and continued down to the end of the XVIIIth century with but little change. The leading of the small panes of glass enabled the texture of the masonry walls to be carried, as it were, through the windows without a break, getting a continuity of surface that was very pleasing, and which these old builders thoroughly appreciated, as at Broadway. The mistake so often made to-day was in glazing windows with a single sheet of glass, producing a cold effect inside, and breaking up the exterior with cavernous spots of black, and emphasising the openings in a manner which was never intended. In these houses the rooms were generally about 7 ft. or 8 ft. high, or even less, for so long as a man of average height could walk about without knocking his head against the ceiling everyone was satisfied.

In many of the houses one or more of the rooms had the open-beamed ceilings richly moulded and sometimes carved, but as time went on this delightful treatment died out and square beams and joists were used, to be finally superseded by the plain plaster ceilings. The main beams were often placed in the rooms without the least regard to the position of the windows and fireplaces over which they happened to come.

Mr. Dawber then briefly described one or two houses—i.e., at Aston Subedge, Gloucestershire, and the farmhouse at Willersey, and, in conclusion, he referred to the obliteration of the older crafts (which could not be sufficiently deplored), and the building by-laws (which had been responsible for the decline of much local building and tradition). In conclusion, he said:—"Is it out of place to raise a plea on behalf of these eloquent though silent witnesses to the craftsmanship of our village ancestors, and to urge that those who had the care or reparation of old cottages and farmhouses should treat them with a gentle hand and more tender regard? Unfortunately, many are being swept away, and the dwellings of our forefathers, so closely interwoven with the life and history of the country, and possessing such an intensely human interest, are being rapidly destroyed, in some cases to make way for what can be regarded as but doubtful improvements. Go where we will and contemplate any old building untouched by the hand of the restorer, and it is impossible not to be impressed by its beauty and subtle charm—the mullioned windows and latticed panes, the roofs a kaleidoscope of varied colours, the venerable walls covered with lichens, the absence of any meretricious or unnecessary ornament, and the wonderful feeling of homeliness that pervades every feature—all combine to produce the essence of simple and beautiful architecture. I would not suggest that, merely for the sake of their antiquity or picturesqueness, unhealthy or insanitary houses should be retained, but I would most strongly urge that where it is possible to save them we should hesitate before breaking any of the few remaining links that bind the villages and country towns of to-day with the interests and associations of the past."

On the motion of Viscount Dillon, who presided, a hearty vote of thanks was accorded to Mr. E. Guy Dawber for his excellent lecture and series of beautiful views. A vote of thanks was also tendered to Viscount Dillon for taking the chair.

VESTIGES OF BERMONDSEY ABBEY.

THE further demolition of the houses in Grange-walk includes the two which mark the site of the East Gatehouse; in one of them were fixed what are believed to be the gate-hooks—the gatehouse remained until 1760. A ground plan, published by Wilkinson in 1820, and described as being from an original drawing taken in 1679, plots the buildings as they stood nearly 140 years after Sir Thomas Pope had pulled down the abbey church together with most of the conventual buildings. At the west end of Grange-walk is plotted the East Gatehouse, giving access into the Base Courtyard. Next, north, to the East Gate is "the Bakehouse"; between the Bakehouse and the west end of Long-walk is shown "where the Mansion House stood," with its "Gallery"—these being on the east side of the Base Courtyard, since Bermondsey-square. To the south of Grange-walk are the "Highway leading to the Grange," "the Stable-yard," with its "Pond," and "Coney-grew" (*sic*). Excavations made in November, 1902, for the South-Eastern Railway Company's working-class dwellings disclosed what were considered to be fragments of the substructure of the chancel of the abbey church on the north side of Long-walk, and, in Abbey-street, in 1903, several skeletons, and two stone coffins containing human remains. Sir Thomas Pope, Treasurer to the Court of Augmentations, used materials of the church and other buildings for his house, whereof the gardens, orchards, pasture lands, etc., covered about 20 acres. T. H. Shepherd's water-colour drawing, made about sixty years ago (now in the Crace Collection), shows the old stones in the walling of Bermondsey House which, after Pope's death at Clerkenwell Priory in 1559, was, with its pleasaunce, acquired by Thomas Ratcliffe, Earl of Sussex, Lord Chamberlain, who lived there in high state. His widow, Frances, daughter of Sir William Sidney, died in 1589, and founded Sidney-Sussex College, Cambridge. Pope founded Trinity College, Oxford. The Crace Collection contains also C. I. M. Whichello's original drawing (engraved by Wilkinson, 1820), of the North, or Great, Gatehouse, at the north-west angle of Bermondsey-square, which survived until 1806, when Abbey-street and most of the square were laid out. Just beyond stood the West Gate, where is now Bermondsey New-road. Over part of Long-walk, and between Long-walk and Grange-walk, stood a palace of William I., his successor, and our earlier Plantagenet kings. The Domesday Survey cites Bermondsey, in Brixton hundred, as held by the King, and before him by Earl Harold, and as having a new and handsome church. William II. bestowed the royal manor upon the priory which Aylwin Child established there in 1082 for Benedictine monks from the Cluniac Priory De Caritate sur Loire; at Richard II.'s request Pope Boniface IX. erected, 1399, the priory into the Abbey of the Holy Saviour, which attained to great opulence and power. After Abbot Wharton's surrender in 1538 the site was granted, July 8, 1541, to Sir Robert Southwell, Master of the Rolls, who, on August 30 of that year, conveyed the property in fee to Sir Thomas Pope and his wife under a sale, afterwards confirmed by letters patent. The monks built for their tenants in Southwark a church which, at the Suppression, was converted into the parish church of St. Mary Magdalene. The church, rebuilt in 1680, was restored by George Porter in 1830, and altered and decorated by Mr. E. Crosse eight years ago; the graveyard, 1¼ acres, was laid out as a public recreation ground in 1886, at a cost of 1,300*l.*, borne by an ordinary vestry rate.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE tenth meeting of the session was held at No. 18, Tufton-street, S.W., on Wednesday, March 14, under the chairmanship of Mr. E. W. M. Wonnacott, when Mr. Geoffrey Lucas read a paper on "Inexpensive Cottages," of which the following is a summary:—

"Inexpensive cottages—a delightful ideal—are also a necessity. There is little doubt that a great change is coming in the placing of the population on the land, with our increased facilities of transit and communication. The factories and the workers must be moved into the country, the workers living within easy distance of their occupation, and enjoying home-life amid the countryside. The most important thing is a good living-room, with sheltered door, and fireplace containing the cooking range well away from draughts. A wide and sunny window is essential. The external door is better if shielded by a porch. The minimum size, for a cottager with wife and three children, is about 14 ft. by 11 ft. Probably it will be better to screen the stairs off from the sitting-room, in spite of the loss of the picturesque effect in the interior. The height depends on the requirements of the local by-laws, otherwise a height of 7 ft. 3 in. to 7 ft. 9 in. is sufficient. A portable range, with boiler if a constant service is available, set in a brick chimney breast, finished with a fair face, and provided with a shelf above shoulder-height, is a good arrangement.

A chamfered wood picture-rail, set just under the ceiling line, saves much knocking about of walls, as do wood linings to the windows.

A wood floor is more comfortable than tile, and should be finished with a square wood skirting, 5 in. high. Whitewash or cream colour-wash is a good wall finish, but tenants usually prefer colour-wash or paper; and, it may be added, sash-windows to casements. A simple dresser is an essential fitting. I do not think a parlour is a necessity for labourers, but may be so for artisans. It can, however, be kept quite small, a minimum size being 10 ft. by 8 ft., fitted with a fireplace and finished like the living-room. Adjoining the living-room is the scullery, say, 8 ft. by 8 ft. minimum, containing sink, at least 30 in. by 18 in., with draining-board and tap and a plate-rack. The copper may have a ventilating hood over it. Shelves for saucepans are a necessity. It is doubtful if a bath is required at all, but, if so, it can be put in the scullery, and hot water drawn from the copper. If possible, the bath should be screened off with a wooden screen, as is cleverly done in Mr. F. Troup's cottage at Letchworth. The combined kitchener and copper and the tip-up bath are both excellent fittings, but their cost is a large item in a cheap cottage. The larder should be large, with wide shelves, and ventilated by air-bricks. The sash-frame should be fixed and partly filled with fly-wire instead of glass.

The coal-hole should hold at least a ton, and may very well be lowered a step, and open out of the scullery. An outside shed for storage is useful, almost essential. Earth-closets should be as simply fitted as possible: seat with pail under, an earth-bucket and shovel being sufficient. Water-closets are but little trouble, and the by-law requiring an outside window can often be got over. The stairs should be from 2 ft. 4 in. to 2 ft. 6 in. in clear, and may be as steep as 8 in. rise and 8½ in. tread. Three bedrooms are the minimum required by decency for a family, though it is difficult in a single living-room cottage to find space for them on the first floor. One room may be quite small, and need not have a fireplace. The landing is sufficiently lit by a fanlight over one door. Generally speaking, a southerly aspect is best, but an east and west aspect is also good. Casements cost less than sashes, and are more sympathetic for cottage work. Wood-skirtings, filled in behind, are good in practice, also tiles, but these are more costly. Matchboard partitions to bedrooms are not sound proof and patent partitions are economical only when used in large quantities. Ledged-doors are good, but liable to sag. No architraves are needed if the linings project to stop the skirting. Bricks seem to be the best and cheapest materials, at least for use in brick districts. Drainage is the most expensive, if necessary, item in a cottage. A cheap and effective system has yet to be devised. Joint drainage, if allowed, effects a great saving. The best sink-gulleys are those with a deep-set grating, the lead waste delivering vertically over this. The rain-water is best collected in rain-water butts or open iron cisterns."

After making some suggestions in regard to exterior treatment, Mr. Lucas said that in regard to the question of village street architecture, continuous lines of houses, instead of detached houses, led to dignity, and he instanced such towns as Blandford and Baldock. Economy in cost was a gain to be considered. In conclusion, he said that the design of inexpensive cottages was well worth doing by architects.

The discussion was opened by Mr. H. G. Collins, and continued by Mr. Drummond and other speakers. A good many practical points were brought out, such as the demand

still found in some districts for brick ovens for bread making, or, as in the west country, earthenware ovens. The use of breeze concrete for wall-plates was a good suggestion, and one or two speakers said that a fillet at chair height saved damage to walls.

Mr. Maurice B. Adams, in summing up the discussion, criticised the many sets of plans shown on the walls, and considered that modern work showed a very great advance in practical qualities, consideration, and value of textures. He thought that all new materials should be carefully considered, but agreed that, so far, brickwork had held its own for external walling. He then dealt with the difference of habits which led to the distinction between the labourers and artisans' homes. Mr. Clough's cottages, with their mansard-roof construction, were instanced as capital examples of economy in building, the Kentish type of high-pitched roof being the opposite extreme. Two of the newer materials were mentioned in bitumen paint for ironwork, and the rot-proof stains for external woodwork, both being commended. The use of uralite on an iron framing was noted for workshop construction.

The Chairman announced that the next meeting would be held on Wednesday, March 28, at 7.15 p.m., at the Law Society's Hall, in conjunction with the Law Students' Debating Society, when a paper would be read by Mr. Wm. Woodward, F.R.I.B.A., on "The Legal Ownership of Architects' Drawings."

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. Evan Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Lambeth Borough Council 5,000*l.* for contribution towards purchase of certain land at Denmark-hill; Poplar Guardians 61,000*l.* for poor law purposes; and St. Marylebone Borough Council 48,545*l.* for electric lighting.

Further Strand Improvement.—The petition presented by the Further Strand Improvement Committee, and referred to on another page, was sent to the Improvements Committee.

Secondary Schools.—The following recommendations of the Education Committee were agreed to :—

"That it be referred to the Education Committee to report as to the steps necessary for the acquisition of sites as follows :—

(i.) In the south-west of London, for the accommodation of the dual school now carried on by the Battersea Polytechnic; (ii.) In the north of London, for a new boys' school; (iii.) In Paddington, for the accommodation of the mixed school now carried on at the London County Council Paddington Technical Institute; (iv.) In North Islington, for a new girls' school; (v.) In the south-west of London, for a new girls' school.

That the Governors of the Addey and Stanhope School (Deptford) be asked to submit plans for the erection of additional classrooms and an additional art room.

That, subject to the Governors of the Aske's School for Boys (Deptford) notifying the Council of their willingness to erect a new block of school buildings out of the funds of the foundation, an equipment grant of 1,000*l.* be offered to them, and that they be informed that the Council will consider the question of increasing its maintenance grant when the new block shall have been completed.

That, subject to the Governors of Aske's School for Girls (Deptford) deciding to increase the accommodation of the school, an equipment grant of 500*l.* be offered to them, provided that the work is put in hand at once and completed to the satisfaction of the Council.

That, subject to the Governors of Camden School for Girls (St. Pancras, N.) deciding to extend the school buildings, an equipment grant of 800*l.* be offered to them by the Council, provided that the work is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the Central Foundation School for Girls (Whitechapel) be asked to submit proposals for the enlargement of the accommodation of the school out of the funds of the foundation, and that, subject to the plans being approved by the Council, they be offered an equipment grant of 400*l.* in connexion with the enlargement, provided that the work is put in hand at once and carried out to the satisfaction of the Council.

That an equipment grant of 500*l.* be offered to the Governors of the Stepney and Bow Foundation in connexion with the rebuilding of the Coopers' Company's School (Mile End), provided that the work is undertaken at once and completed to the satisfaction of the Council, and that they be informed that the Council will consider the question of increasing the maintenance grant in connexion with the rebuilding of the school.

That the Governors of the Greycoat Hospital (Westminster) be informed that the Council will consider the question of increasing its maintenance grants for the year 1906-7 on the completion of the extension of the buildings now being made.

That the Governors of James Allen's School (Dulwich) be asked to submit proposals for the extension of the school buildings in order to reduce the size of the classes, and that an equipment grant of 400*l.* be offered to the Governors in connexion with the enlargement, provided that the work is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the Latymer Upper School (Hammersmith) be asked to submit, at an early date, plans for increasing the accommodation of the school at the expense of the foundation.

That the Governors of the Owen's School (boys) (Finsbury, C.) be asked to submit proposals for the enlargement of the school, or for the removal of the boys' school to a more northern part of the county.

That the Governors of Parmiter's School (Bethnal Green, N.E.) be asked to submit proposals for the enlargement of the accommodation of the school out of the funds of the foundation, and that, subject to the proposals being approved, they be offered an equipment grant of 300*l.* in connexion with the enlargement, if carried out at once to the satisfaction of the Council.

That the Governors of the Roan School (girls) (Greenwich) be offered a grant of 6,000*l.* in connexion with the erection of new buildings, provided that the work is commenced at once, and completed to the satisfaction of the Council.

That the Governors of St. Mary's College (Paddington, N.) be informed that, subject to their undertaking to obtain the premises of the Kensington Park High School, and thus increase the accommodation of their school by September, 1906, the Council will consider the question of increasing its maintenance grant.

That the Governors of St. Olave's and St. Saviour's Grammar School (boys) (Rotherhithe) be offered an equipment grant of 2,000*l.* towards the cost of extending the accommodation of the present building, on condition that it is taken in hand at once and completed to the satisfaction of the Council.

That the Governors of St. Saviour's and St. Olave's School (girls) (Bermondsey) be offered an equipment grant of 1,500*l.* towards the cost of extending the accommodation of the present buildings, on condition that the work is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the Whitechapel Foundation School (Whitechapel) be asked to submit proposals for enlarging the school on the falling in of the lease of premises adjoining the school, and that an equipment grant of 500*l.* be offered to them in connexion with the enlargement, provided that it is put in hand at once and completed to the satisfaction of the Council.

That the Governors of the William Ellis School (St. Pancras, N.) be asked to provide two additional classrooms, and new desks.

That, subject to the Governors of the Lewisham Grammar School (Lewisham) consenting to enlarge the accommodation of this school to the satisfaction of the Council, they be offered a grant of 6,000*l.*"

General Lines of Buildings in Fulham-road and Fulham Park-road.—The Building Act Committee reported as follows :—

"On May 3, 1904, we reported that a successful appeal had been made to the Tribunal of Appeal against the certificate of the architect of the Council, acting in the capacity of the superintending architect of metropolitan buildings, defining the general line of buildings on the south side of Fulham-road, westward of Munster-road. We have now to report that on December 22, 1905, the superintending architect defined the general line of buildings on the western side of Fulham-park-road btween Fulham-road and Landridge-road, that an appeal was made against his certificate, and that on January 23, 1906, the Tribunal of Appeal reversed the certificate and decided that there was no general line of buildings on the western side of the street leading from Fulham-road to the junction of Fulham-park-gardens and Fulham-park-road. The result of this decision is that, except in so far as the provisions of sect. 13 of the London Building Act, 1894, as to the prescribed distance may apply, there is nothing to prevent the erection of houses on the site in question close up to the public way. In order that the effect of these decisions of the Tribunal of Appeal, which enable the applicants to build very considerably in advance of the lines defined by the superintending architect, may be clearly understood, we have given instructions for a cartoon to be prepared and hung in the Council chamber. . . ."

Mr. Cobb asked why the case was allowed to go by default, and why the borough council was not informed that the Council intended to take no action.

Captain Hemphill said that the case did not go by default. There was a decision on the report of the superintending architect defining the line, and it was not usual for the Council to appear on such occasions. In nearly all cases, whether the Council was right or wrong, the Tribunal allocated the costs against the Council.

Mr. Phillimore said that the Council did not appear as a party to the appeal, and consequently the Tribunal was not able to pile up the costs against the Council.

Colonel Rotton asked if it was true that the Tribunal was habitually unfair to the Council. That seemed a very serious statement to make, and if the statement was true and the Tribunal was in the habit of piling up the costs against the Council, then it would be necessary to get another Tribunal. (Several members: That is what we want.) The state of affairs was very unsatisfactory.

Captain Hemphill said there was no reason why the borough council should not, if they had desired, have taken action in the matter. As to the Tribunal, he did not intend to say that they were habitually unjust to the Council, but their decisions had been in the great majority of cases against the interests of the public and in the interests of the people who appeared before the Tribunal against the reasonable and fair decisions of the Council.

Holborn to Strand and Southampton-row—Tramway-subway and Paving, etc., Works.—The Highways and Improvements Committees recommended, and it was agreed, that additional expenditure not exceeding 550*l.* be sanctioned in respect of the employment of a resident engineer and of clerks of works in connexion with the execution, under the direction of the Works Committee, of the paving and tramway-subway, etc., works in the Holborn to Strand and Southampton-row improvements.

Encroachment on Land, Mansell-street.—The Improvements Committee reported as follows :—

"In connexion with the Mansell-street improvement terms were agreed for the purchase of the portion of the site of the Swan public-house needed for widening the road to 50 ft. It was arranged that this width should be measured from the front of the forecourt of the buildings on the opposite side of the road, but, owing apparently to an oversight on the part of the persons acting for the owners of the Swan public-house, the premises were rebuilt with the frontage 50 ft. from the frontage of the buildings on the opposite side of the road, and not, as arranged, 50 ft. from the front of the forecourts. The encroachment on the land purchased for the improvement is about 2 ft. 3 in., while the area of the land which has been encroached upon is about 63 sq. ft. We have agreed with the owners of the property for the deduction, owing to this encroachment, of 500*l.* from the purchase-money payable to them, and that when the premises are rebuilt the frontage shall be set back to the proper line without further compensation. This sum represents rather less than twice the *pro rata* cost of the land which has been unlawfully built upon, and is calculated on the basis of the total amount payable to the owners in respect of their interest in land and the disturbance to their trade. We recommend that the arrangement under which, in consequence of an encroachment upon land acquired for the widening of Mansell-street, 500*l.* has been deducted from the compensation payable to the owners of the Swan public-house, No. 94, Mansell-street, be confirmed."

After discussion, the matter was referred back to the Committee.

Site for Sub-Fire Station.—The Highways Committee reported, and it was agreed, that the estimate of expenditure on capital account of 10,000*l.*, submitted by the Finance Committee to cover the cost of acquiring the property in Gray's Inn-road, submitted to the Highways Committee on January 25, 1906, be approved.

Holborn to Strand—"Morning Post" Premises.—The Improvements Committee recommended, and it was agreed, that the approval of the construction of vaults in Aldwych, Wellington-street, and Exeter-street at the *Morning Post* premises be confirmed; and that the construction of a lift in a recess on the Exeter-street side of the building and of an opening in the footway in Wellington-street as shown on the plan be sanctioned.

Goldsmiths' College.—The following recommendations of the Education Committee were agreed to :—

"That the estimate of expenditure on maintenance account of 4,000*l.*, submitted by the Finance Committee, in respect of the grant of that amount for the maintenance of day and evening classes at the Goldsmiths' College, be approved.

That, subject to suitable arrangements being made with the University of London for the conduct of the school of art at the Goldsmiths' College on sufficiently practical lines to meet the views of the Council, the Council do express its willingness to contribute for the present a grant not exceeding 1,000*l.* a year for the maintenance of the day and evening classes therein.

That the department of mechanical and electrical engineering and the classes connected with the building trades now conducted at the Goldsmiths' College be removed as soon as possible to a new institution; and that it be referred to the Education Committee to consider and report as to the provision of such institution as near as may be to the New Cross or Lewisham Junction railway stations.

That arrangements be made by the Council for the provision of evening classes either in the new institution referred to in resolution or in a separate institution in the neighbourhood of New Cross.

That, pending the provision of other suitable accommodation, the Council do make a grant to the University of London to cover the actual cost of conducting the evening classes in mechanical and electrical engineering and the building trades at the Goldsmiths' College, such grant not to exceed 2,000*l.* a year."

Stepney Jewish School.—The Education Committee reported that on February 21, 1905, they decided to ask the trustees of the

Stepney Jewish School (Stepney) to join with the Council in making application to the Board of Education for a scheme dealing with the management of the school trust. The trustees have now forwarded their application, which is as follows :—

"(i.) For permission to contribute the Rothschild fund of 3,000*l.* towards the cost of building an assembly hall, new classrooms, and making improvements in the existing building, which would include the alterations required by the Council.
(ii.) The trustees propose to add to the school site a piece of freehold land which is stated to be the property of the committee.
(iii.) The trustees also propose to provide from their own funds an additional sum of 4,000*l.* towards the buildings and improvements."

The Committee recommended, and it was agreed, that, subject to the plans of the new buildings and alterations being approved by the Council, and to provision being made in the scheme as to the amount of the income of the fund (when replaced) which should be paid to the Council under sect. 13 of the Education Act, 1902, the trustees of the Stepney Jewish School (Stepney) be informed that the Council has no observations to offer on the proposed application to the Board of Education for a scheme.

The Tribunal of Appeal under the Building Act.—The Building Act Committee reported that they had had under consideration a letter from the Home Secretary forwarding, for the observations of the Council, a copy of a letter received from the members of the Tribunal of Appeal constituted under sect. 175 of the London Building Act, 1894, asking that the rate of remuneration granted to them in respect of their services may be increased. In accordance with the terms of sect. 179 of the Act, the Home Secretary in 1894 decided that the members of the Tribunal should be paid by fees, and fixed the amount of the fees at three guineas for the first hour and two guineas for each subsequent hour of each day's sitting of the Tribunal, and in 1895 it was laid down that such remuneration was limited to the sitting of the Tribunal in its judicial capacity. The amount of the fees then fixed has remained unchanged up to the present. The members of the Tribunal ask that the rate of remuneration may be increased to five guineas for the first hour and three guineas for each subsequent hour or part of an hour, and that each member should receive a minimum fee of twelve guineas in respect of each appeal when an appointment has been fixed, whether the case is argued before the Tribunal or not, and further that such fees should be paid whether the members of the Tribunal are acting judicially or not, provided they are employed in the work of the Tribunal. The Committee proceeded :—

"It is stated that the maximum amount earned by any member of the Tribunal during the ten years 1895-1904 inclusive was 940*l.* 16*s.*, which was paid in respect of 103 appeals, five of which were settled without being heard and the average amount received in respect of the ninety-eight sittings of an average duration of rather less than four hours was thus 9*l.* 12*s.* This amount appears to us to be sufficient even if the members are prevented from making professional appointments on the days fixed for the hearing of appeals. The increased number of appeals which may be made under the London Building Acts (Amendment) Act, 1905, is advanced by the members of the Tribunal as one reason why the rate of remuneration should be increased. It is, of course, impossible at the present time to form any opinion as to what the number of appeals under the new Act may be, but we are of opinion that, shou'd the number be large, it would probably be found advisable for the Tribunal to sit at stated intervals, and if necessary to continue the sittings from day to day until all the cases then before them had been settled. Should this be the case, and assuming that the sittings lasted six hours each day, the average remuneration for each member would be about thirteen guineas, and we are, therefore, strengthened in our opinion that the present scale of fees is adequate."

The Committee recommended accordingly, and the motion was agreed to.

White Hart-lane Estate—Erection of Shops.—The Housing of the Working Classes Committee recommended, and it was agreed :—

"That tenders be invited from selected firms for the erection of four shops fronting Lordship-lane at the south-western corner of the White Hart-lane estate; that bills of quantities be not prepared and that the form of contract do provide that payments to the extent of 80 per cent. of the work done be made to the contractor in fortnightly instalments upon the architect's certificate, that a further 15 per cent. of the value be paid on the completion of each shop, and that the remaining 5 per cent. be paid within one month after the completion of each shop, subject to any liability as to the maintenance of the buildings."

Holborn to Strand—Letting of the Central Portion of the Crescent Site.—The Improvements Committee reported as follows :—

"We have had before us a proposal for a lease, for ninety-nine years, at a rent of 55,000*l.* a year, of the central portion of the crescent site formed in connexion with the Holborn to Strand improvement, the site has an area of about 123,350 sq. ft., and lies between Aldwych and the Strand, being bounded on the east and west by the 50 ft. approaches which it is proposed to form between the Strand and Aldwych. It has frontages of about 636 ft. to Aldwych, about 413 ft. to the Strand, about 236 ft. to the approach on the west side of the site, and about 251 ft. to that on the east side. The proposal has been made by Mr. L. Wormser on behalf of a syndicate who have prepared a scheme for developing the site as a whole. A company is to be formed for this object with a capital of 1,000,000*l.*, and arrangements have been made for underwriting nearly the whole of this amount. From inquiries made through the Council's bankers, we are satisfied that the necessary capital will be forthcoming, and that the financial position of the underwriters justifies the Council in favourably considering the present offer.

It is proposed to erect on the central portion of the site a stone building of commanding architectural features. This building will contain large galleries for use in connexion with a permanent exhibition of arts and manufactures; it will also contain a theatre, a concert hall, and a restaurant. Beyond the central block of buildings the site will be inclosed by shops with basements, ground floors, and two floors above. There will be seventy-eight shops on the ground floor and seventy-eight on the first floor, while the second floor will be let for commercial purposes. The promoters have undertaken to spend not less than 500,000*l.* in the erection of these buildings. They state that negotiations have already been commenced for letting portions of the buildings, and that they have no doubt as to the disposal of the whole to substantial tenants. There will be no larger area between the shops and the central building than that which is necessary to provide for the access of light and air. The plans, elevations, and specifications of all the buildings will be entirely subject to the Council's approval.

The lease will be in the Council's usual form, subject to such modifications as may be necessary for the special undertaking, and will give the Council entire control as to the uses to which the buildings will be put, and also the right of re-entry, if the buildings are put to any other use than that sanctioned when the lease is taken up. . . .

We recommend that, subject to the terms and conditions of an agreement to be prepared by the Council's solicitor, the central portion [having an area of about 123,350 sq. ft. . . . of the crescent site, formed in connexion with the Holborn to Strand improvement, be let for a term of ninety-nine years at a rent of 55,000*l.* a year on an agreement for a lease to Mr. L. Wormser, on behalf of a syndicate which has been formed for dealing with the site; and that the Improvements Committee be authorised to complete the matter on the basis (i.) that one year's peppercorn be allowed, and that the rent for the second and third years be at the rate of 27,500*l.* a year; (ii.) that one year's ground rent (55,000*l.*) be paid to the Council upon the signing of the building agreement, and that this sum be forfeited to the Council in the event of the promoters not taking up their lease; (iii.) that no public drinking bars be allowed other than those proposed to be used in the theatre during the performances, and that these be subject to the usual requirements of the Lord Chamberlain, and that the sale of alcoholic liquors be restricted to the central building and to the courts and verandahs forming part thereof; (iv.) that the buildings be erected in accordance with plans to be approved by the Council and that a sum of not less than 500,000*l.* be spent in the erection of such buildings; (v.) that no deviation from or alteration of these plans be allowed without the previous sanction of the Council; (vi.) that the Council reserves the right to terminate the lease at any time and to enter into possession of the site and the buildings erected thereon if, without the previous permission of the Council, such site or buildings be put to any other use than that sanctioned by the Council when the lease is taken up; and (vii.) that no part of the site or of the buildings thereon be sub-let without the sanction of the Council."

Mr. Hubbard, the Chairman of the Committee, said that they had had a petition presented from the Royal Academy; there had been previous petitions of the same character, and the Council had always decided to take no action. With regard to the previous scheme, that was an offer for an option of a lease without a deposit, but in the present scheme they had a definite offer for a lease, with a deposit of 55,000*l.* upon signing the agreement. The other scheme involved a licence for the whole of the central building, grounds, and terraces, but now the licence would be only for the restaurant in the central building and in the open courts, or verandahs, where food would be served, and these would be much smaller than the open spaces in the previous scheme. There would be only one theatre, instead of two, and there would be two-story shops with one floor above, and no promenades on the roofs of the shops, as was proposed in the former scheme. The area of the open courts would be restricted to a minimum compatible with the access of light and air, and, owing to the number of shops being increased from about sixty to 176, the Council would have increased security for its ground rent. Another important matter was that, whereas in the former proposal there was no fixed amount for the expenditure on the buildings, the Committee had now secured a minimum expenditure of 500,000*l.*

Mr. Howell Williams congratulated the Committee upon having made such a good bargain.

Sir Melvill Beachcroft, while joining in that congratulation, stated that there was a very strong feeling about the alignment, and an influential committee had been formed with the object of getting a better architectural view of the Law Courts. He proposed, therefore, to ask the Council to add the following words to the recommendation :—"And that the building line at the south-east end be such as the Council may determine, having regard to the alignment which the Council may fix hereafter."

Captain Swinton seconded the addendum, remarking that if this proposal were accepted it might be possible to get an adequate view of the Gladstone statue.

The Chairman ruled that Sir Melvill Beachcroft's amendment was out of order, as it would increase the cost of the improvement, and must, therefore, be dealt with as a separate recommendation.

The recommendation of the Committee was then, without further discussion, adopted with only one dissentient.

Road Widening, Old Brompton-road, Kensington.—The Improvements Committee recommended, and it was agreed, that expenditure not exceeding 2,265*l.* be sanctioned in respect of the widening of Old Brompton-road near Sumner-place; that consent be given under sect. 72 of the Metropolis Management (Amendment) Act, 1862, to the widening executed by the Council of the Royal Borough of Kensington.

The Council adjourned at 7.30 p.m.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Norwood and Wandsworth.†—Buildings on the south side of Lancaster-road, Norwood, between Chatsworth-road and Dalmore-road (Mr. C. J. Bentley for Mr. L. S. Rogers).—Consent.

St. Pancras, West.—The retention of an illuminated sign at No. 292, Euston-road, St. Pancras (Mr. A. Monighetti).—Consent.

Lewisham.†—Retention of two projecting shops at Nos. 17 and 19, Loampit-vale, Lewisham (Messrs. Blake & Dannatt).—Consent.

Wandsworth.—A flight of steps in front of the Southfields Baptist Chapel, Wimbledon-park-road, Wandsworth (Mr. R. H. Weymouth).—Consent.

Woolwich.—Bay windows in front of Nos. 20, 26, 28, and 30, Beechill-road, Eltham (Mr. J. J. Bassett for Mr. A. Cameron Corbett).—Consent.

Woolwich.—Bay windows in front of Nos. 1 and 7, Glenshiel-road, Eltham (Mr. J. J. Bassett for Mr. A. Cameron Corbett).—Consent.

Woolwich.—A porch to a house to be known as "Dulce Domum," on the western side of Cleanthus-road, Shooter's-hill, Plumstead (Mr. A. A. Beard).—Consent.

Deptford.—Ten one-story shops at the junction of Horstead-road, Arica-road, and Revelon-road, Brockley (Mr. A. H. Kersey for the trustees of the late Robert Kersey).—Refused.

Battersea.—A porch to a proposed new church on the east side of Altenburg-gardens, Clapham-common (Messrs. Kelly & Dickie for the Rev. G. Grady).—Refused.

Marylebone, East.—An iron and glass shelter to the premises of Messrs. Waring, Limited, Oxford-street, St. Marylebone, on the east side of Binstead-street (Mr. R. F. Atkinson for Messrs. Waring, Limited).—Refused.

Width of Way.

Dulwich.—A building on the north side of Grace's-mews, Camberwell-grove, Camberwell, with the forecourt boundary fence at less than the prescribed distance from the centre of the roadway of the street (Mr. A. W. Osborn, for Mr. J. F. Chiverall).—Consent.

St. Pancras, East.—A two-story building at the rear of No. 8, Rochester-square, Kentish-town, to abut upon Rochester-place at less than the prescribed distance from the centre of the roadway of that street (Mr. T. B. Westacott for Mr. W. Baskwill).—Consent.

Stepney.—A wood and glass roof over a portion of the yard at the rear of No. 52, Mile End-road, Stepney, at less than the prescribed distance from the centre of the roadway of Cecil-street (Mr. W. E. H. Crawley for Messrs. Franks & Simons).—Consent.

Camberwell, North.—Houses on a site on the east side of Elmington-road, Camberwell, with the forecourt fences at less than the prescribed distance from the centre of the roadway of that street (Mr. W. M. Proudfoot for Mr. S. F. Cope).—Refused.

Kensington, South.—The retention of an iron forecourt railing in front of No. 22, Aubrey-walk, Kensington, at less than the prescribed distance from the centre of the roadway of the street (Messrs. Selby and Kislingbury for Mr. A. Withers).—Refused.

Width of Way, Lines of Frontage and Prjoections.

Islington, North.—A library building with projecting porches on the east side of Holloway-road and south side of Fieldway-crescent, Islington (Mr. H. T. Hare for the Islington Metropolitan Borough Council).—Consent.

Width of Way and Space at Rear.

Bethnal-green, South-west.—A building at the corner of old Nichol-street and Chance-street, Bethnal-green (Mr. C. R. Peters).—Consent.

Width of Way and Construction.

Woolwich.—Three temporary wood and iron sheds at the Borough Council's Callis-yard Depot, Woolwich, at less than the prescribed distance from the centre of Callis-yard (Mr. J. Rush Dixon for the Woolwich Metropolitan Borough Council).—Consent.

Lines of Frontage and Construction.

Rotherhithe.—An iron gangway to connect Hay's Wharf and Willson's Wharf, over the public right of way leading from Battle-bridge-lane to Battle-bridge-stairs, Rotherhithe (proprietors of Hay's Wharf).—Consent.

Rotherhithe.†—A wood and iron chute of a temporary character to connect Hay's Wharf with Willson's Wharf, over the public way of Battle-bridge-lane, Rotherhithe (the proprietors of Hay's Wharf).—Consent.

Space at Rear.

Hampstead.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building, to be known as No. 8, Frognal-terrace, West End-lane, Hampstead, with an irregular open space at the rear (Mr. R. L. Pearce for the Middlesex Building Company, Limited).—Consent.

Deptford.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on a site at the junction of Horstead, Arica, and Revelon-roads with irregular open spaces at the rear (Mr. A. H. Kersey for the trustees of the late R. Kersey).—Refused.

Cubical Extent.

Strand.—A building on the site of Nos. 132-135, Long-acre, to exceed in extent 250,000 cub. ft., and to be used for the purposes of a motor carriage works, repair shops, and showrooms (Mr. W. Woodward for Messrs. Slatter & Son and Mr. W. H. Eastgate).—Refused.

Height of Buildings.

St. George, Hanover-Square.—That the application of Mr. C. L. Morgan, for the London, Brighton, and South Coast Railway Company, for an extension of the period within which the erection of an addition to the Grosvenor Hotel, Victoria-station, Buckingham-palace-road, Westminster, was required to be completed, be granted.—Agreed.

The recommendations marked † are contrary to the views of the local authorities.

Fifty Years Ago.

FROM THE *Builder* OF MARCH 22, 1856.

TYNDALL'S-BUILDINGS is a court containing twenty-two houses, of which the society have obtained possession of seventeen, including the two shops in Gray's Inn-lane, one on each side of the archway, and will presently have the rest. The houses are all front, few of them having even the smallest outlet, and are in the most miserable state of dilapidation. The shutters and doors are broken; from most of the windows projects a well-known apparatus for drying the day's "wash"; the pavement is broken and out of level, retaining decomposing matter to contaminate the air; while the basement story of nearly all the houses is filled with fœtid refuse, of which it has been the receptacle for years. In some of the houses it would seem scarcely possible that human beings could live: the floors are in holes, the stairs broken down, and the plastering fallen; nevertheless, they are densely peopled, and as much rent is paid for the rooms as ought to obtain for the tenants decent accommodation. In one the roof has fallen in. It was driven in by a tipsy woman one night, who sought to escape over the tiles from her husband. Listen to the conversation, if so it may be called, of those inhabiting it: you will find it in keeping with the disordered, disruptured, disreputable locality: notice the faces that press against the window-pane, or come out in to the doorways as a stranger passes round the court; you will find them altogether in accordance—as the house, so the inmates. Three or four years since, several of the cellars were inhabited, the place was ill-drained, cesspools were in the dark underparts. The police have since then interfered, and the drainage has been slightly improved. The condition, however, is still bad enough. Take, for example, one of the houses as a specimen of the rest. Entering the doorway, we were shown a narrow staircase, dark as night, broken and shaky, down which we groped with bent back and much difficulty. At the bottom a glimmering light showed a water-barrel which would hold fifty or sixty gallons at the most. It was at this time not eleven o'clock in the morning, and the water was all gone, and this was not to be wondered at, when we found that this barrel was the only supply furnished for two houses, which, at the lowest calculation, contained a population of 100 persons old and young—this to serve for all purposes of cleanliness and domestic use. In this dim undercroft was also the only convenience provided for the same number of persons. The smell was abominable. The owners of such places, as we have before observed, say:—"People of this sort are naturally dirty, and it is useless to do anything with them." We would ask in reply, "How is it possible that good habits can be acquired under such circumstances?"

Illustrations.

PALAZZO AVIGNONESI, MONTEPULCIANO.

THE Palazzo Avignonesi was built by Giacomo Barozzi, of Vignola, during the latter half of the XVIIth century. The building looks well in execution, being situated upon the angle of the main thoroughfare (a very steep hill) of Montepulciano, a small town in Central Italy, about 2,000 ft. above sea level.

The ground floor rooms are vaulted over, and, although now used as a granary, still retain very good frescoed ceilings and walls.

The sections show the curious arrangement of window seat and step up so often used in Italian houses.

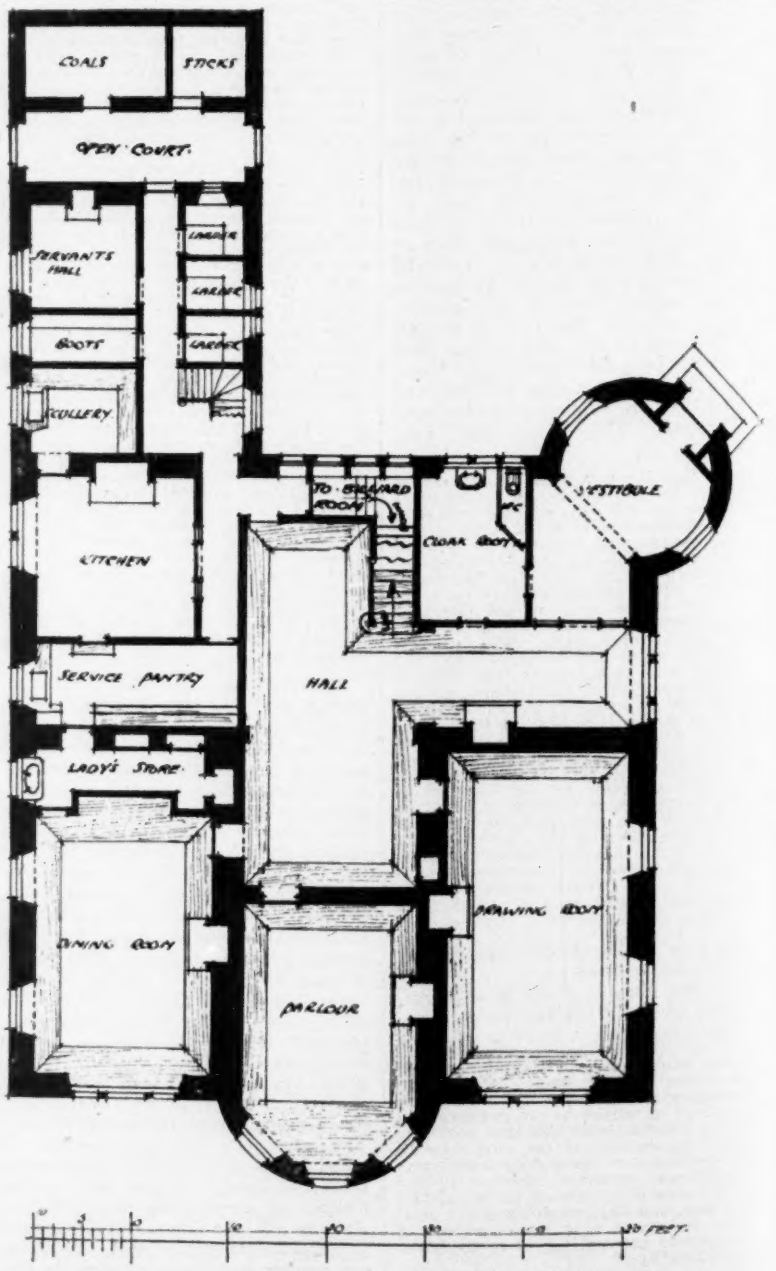
The upper floors have been reconstructed, and are now used as flats, although the façade remains untouched. The coat of arms over the doorway is that of Cardinal Roberto Bellarmin, being probably added after the completion of the building.

LIONEL U. GRACE.

BLEBO HOUSE, FIFESHIRE.

THESE illustrations show additions which have been made to Blebo House, Cupar, Fife.

The house, which stands on a very finely wooded site, is of a simple Classic design typical of Scotch mansion houses about the middle of the XVIIIth century, and is built of local yellow sandstone. The additions have been carried out in the same stone, and the roofs are covered with green

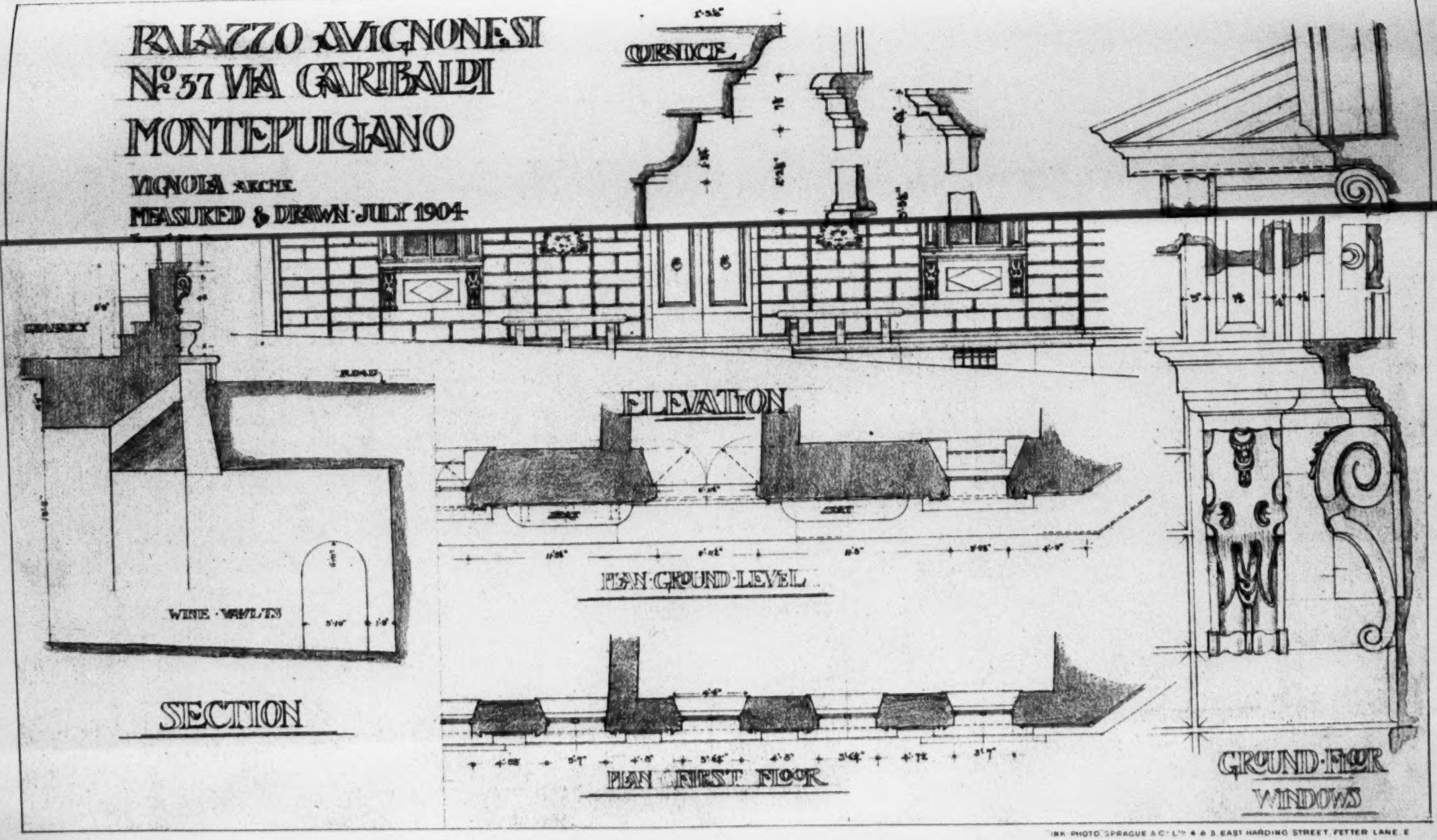


Blebo House, Fifeshire. Plan.

PALAZZO AVIGNONESI
Nº 57 VIA GARIBALDI
MONTEPULCIANO

VIGNOLA ARCHT.

MEASURED & DRAWN JULY 1904



INK PHOTO SPRAGUE & Cº LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E

...as built by ...gnola, dur... the XVIth ... looks well ... the angle ... steep hill ... in Central ... level.

...ilted over, ...mary, still ...and walls. ...arrangement ...ken used in ...

...onstructed, ... the façade ...arms over ...al Roberto ... after the ...

...Grace.

...IRE.

...ions which ...upar, Fife. ...very finely ...ssic design ... about the ...and is built ...e additions ...ame stone, ...with green

tiles from her hus-
versation, if so it
inhabiting it: you
ith the disordered,
locality: notice the
ne window-pane, or
ways as a stranger
you will find them
as the house, so the
years since, several
ited, the place was
in the dark under-
nce then interfered,
slightly improved.
is still bad enough.
of the houses as a
tering the doorway,
ow staircase, dark
ky, down which we
nd much difficulty.
ring light showed a
hold fifty or sixty
was at this time not
ning, and the water
vas not to be won-
nd that this barrel
shed for two houses,
ulation, contained a
old and young—this
s of cleanliness and
undercroft was also
vided for the same
-smell was abomin-
h places, as we have
People of this sort
it is useless to do
We would ask in
le that good habits
h circumstances?"

Illustrations.

PALAZZO AVIGNONESI, MONTEPULCIANO.

THE Palazzo Avignonesi was built by Giacomo Barozzi, of Vignola, during the latter half of the XVIth century. The building looks well in execution, being situated upon the angle of the main thoroughfare (a very steep hill) of Montepulciano, a small town in Central Italy, about 2,000 ft. above sea level.

The ground floor rooms are vaulted over, and, although now used as a granary, still retain very good frescoed ceilings and walls.

The sections show the curious arrangement of window seat and step up so often used in Italian houses.

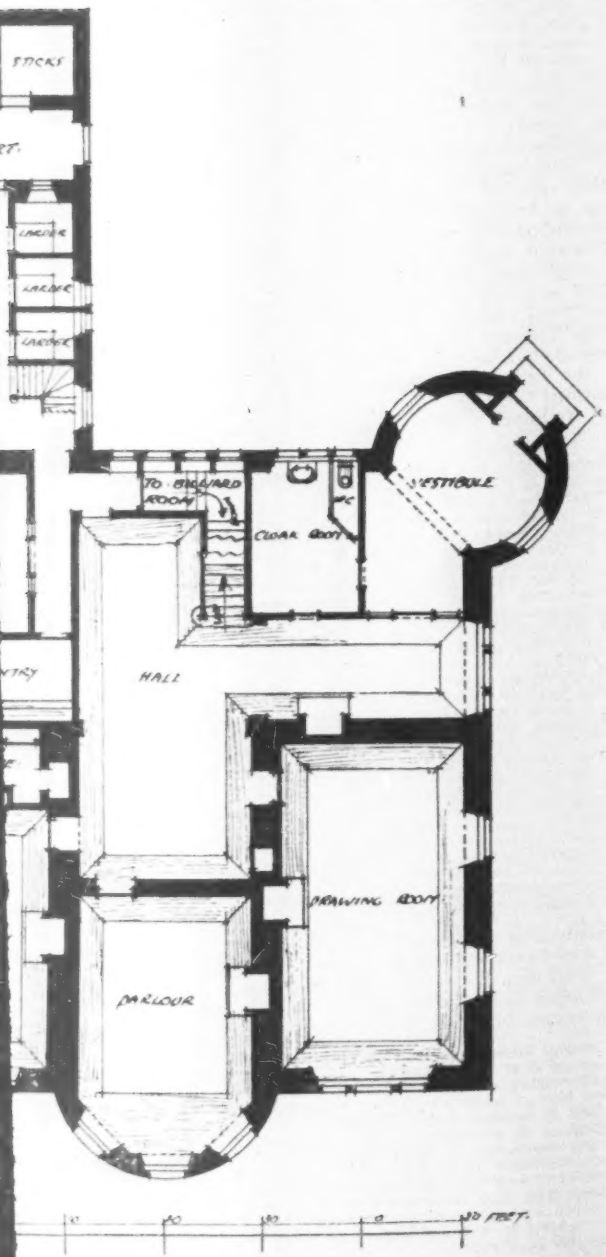
The upper floors have been reconstructed, and are now used as flats, although the façade remains untouched. The coat of arms over the doorway is that of Cardinal Roberto Bellarmin, being probably added after the completion of the building.

LIONEL U. GRACE.

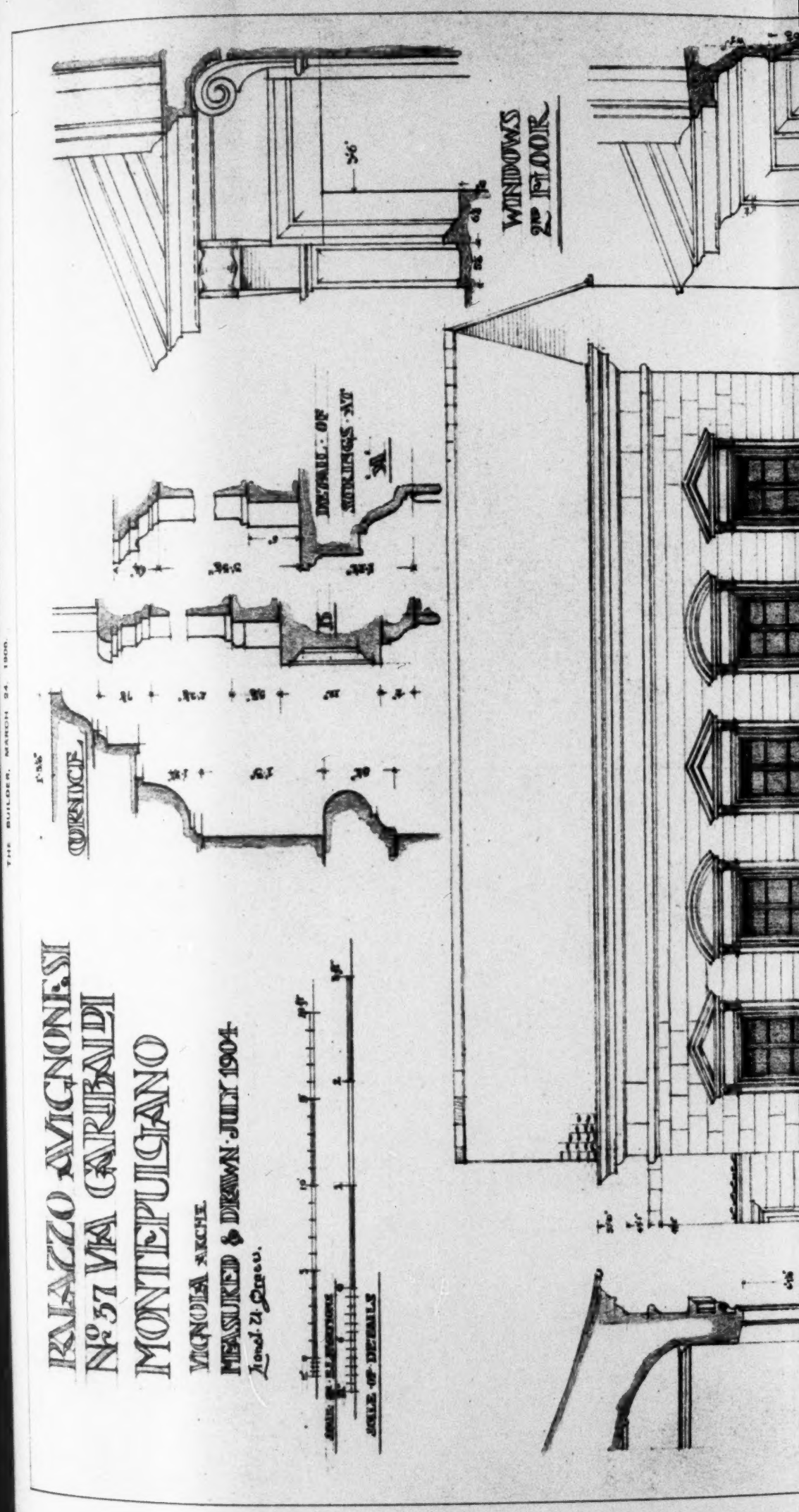
BLEBO HOUSE, FIFESHIRE.

THESE illustrations show additions which have been made to Blebo House, Cupar, Fife.

The house, which stands on a very finely wooded site, is of a simple Classic design typical of Scotch mansion houses about the middle of the XVIIIth century, and is built of local yellow sandstone. The additions have been carried out in the same stone, and the roofs are covered with green



Blebo House, Fifeshire. Plan.



GROUND FLOOR WINDOWS

PLAN FIRST FLOOR

PLAN GROUND LEVEL

ELEVATION

SECTION

FIRST FLOOR WINDOWS

INK PHOTO SPRAGUE & C° L™ 4 & 5 EAST HARDING STREET FETTER LANE E.C.

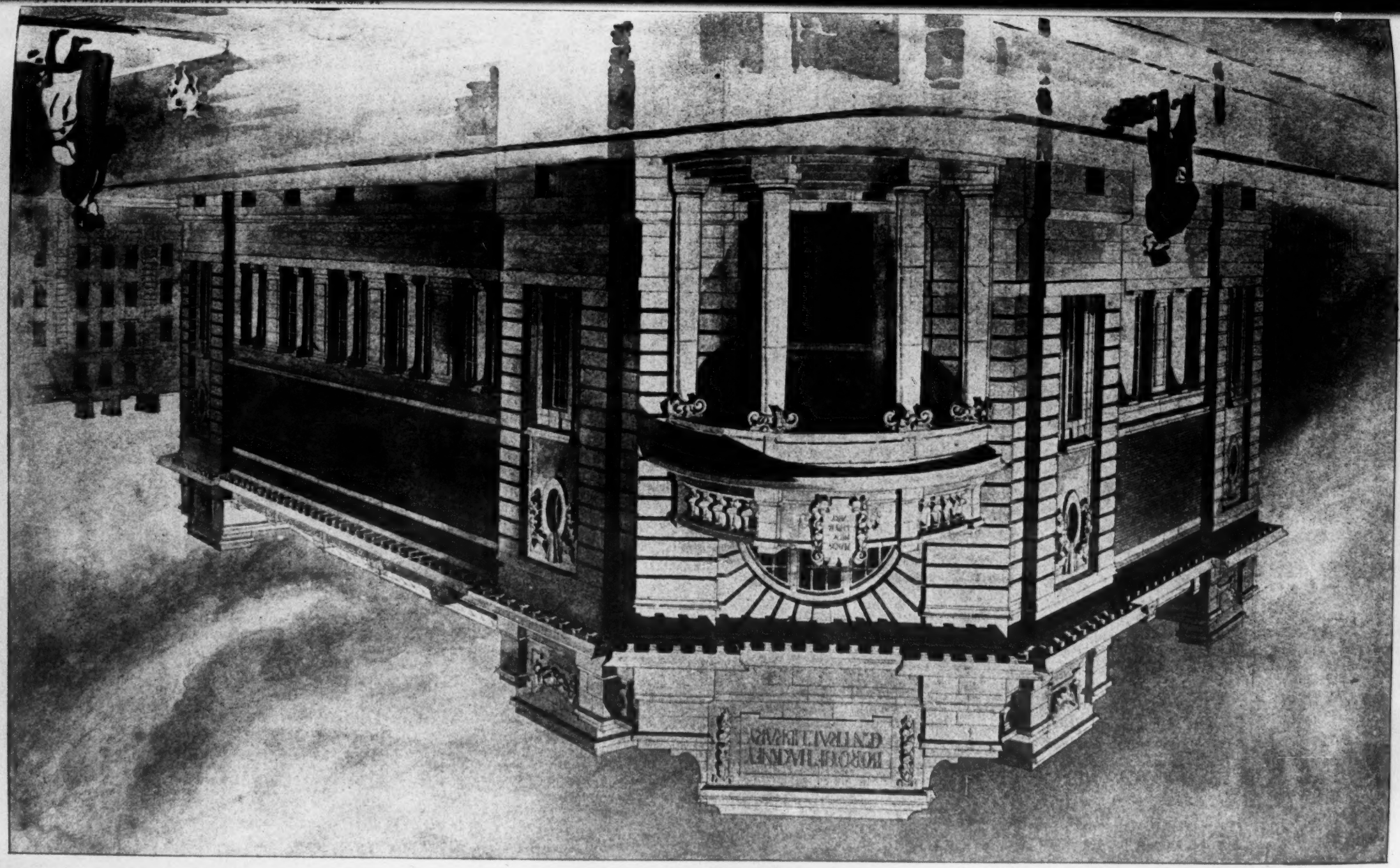
BLEBO HOUSE, FIFESHIRE.—Mr. James Findlay, Architect.

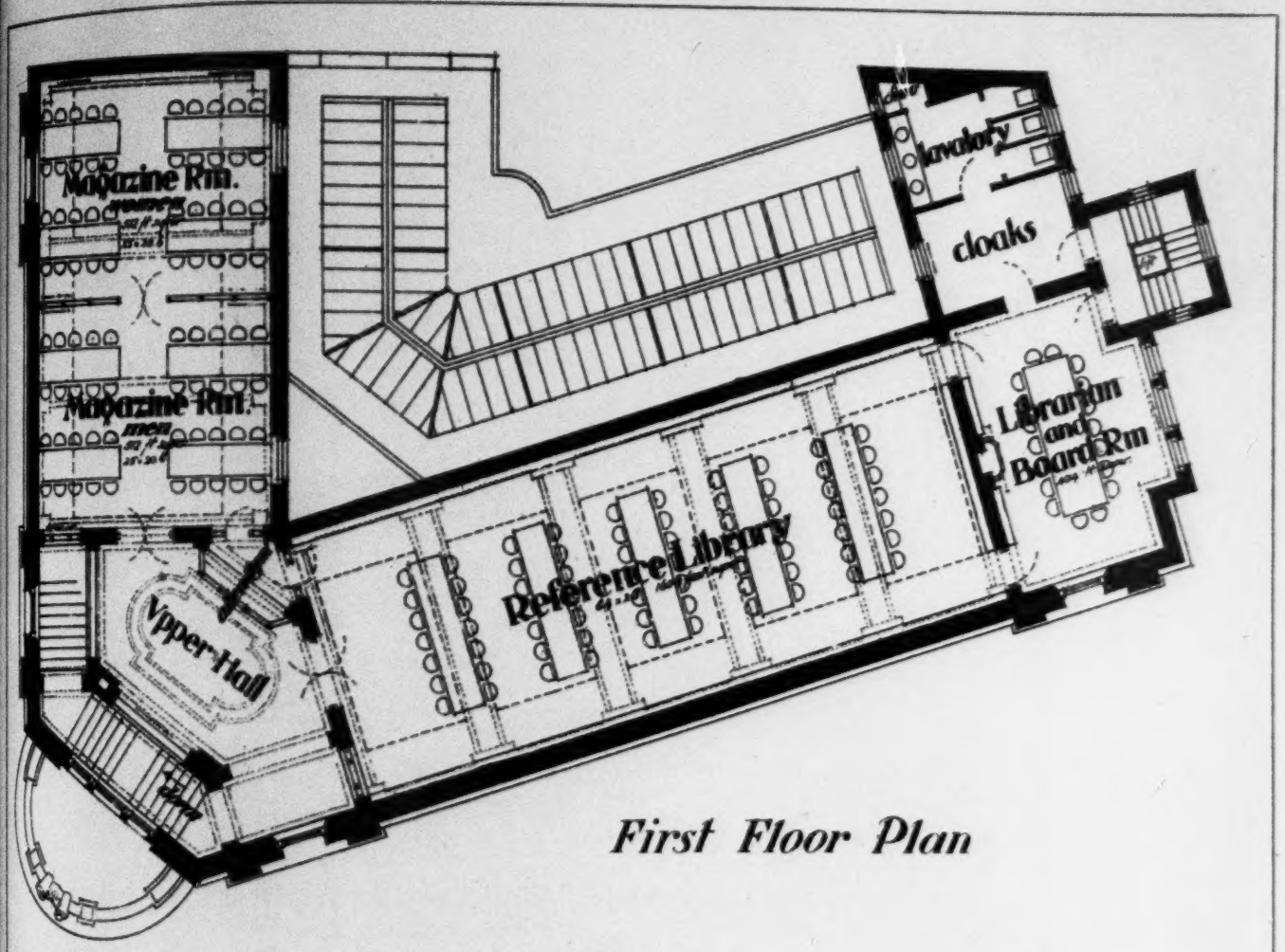
BLEBO HOUSE, FIFESHIRE.—Mr. James Findlay, Architect.

INK PHOTO SPRAGUE & C° LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

INK PHOTO SPRAGUE & C° LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

BLEBO HOUSE, FIFESHIRE.—Mr. James Findlay, Architect.





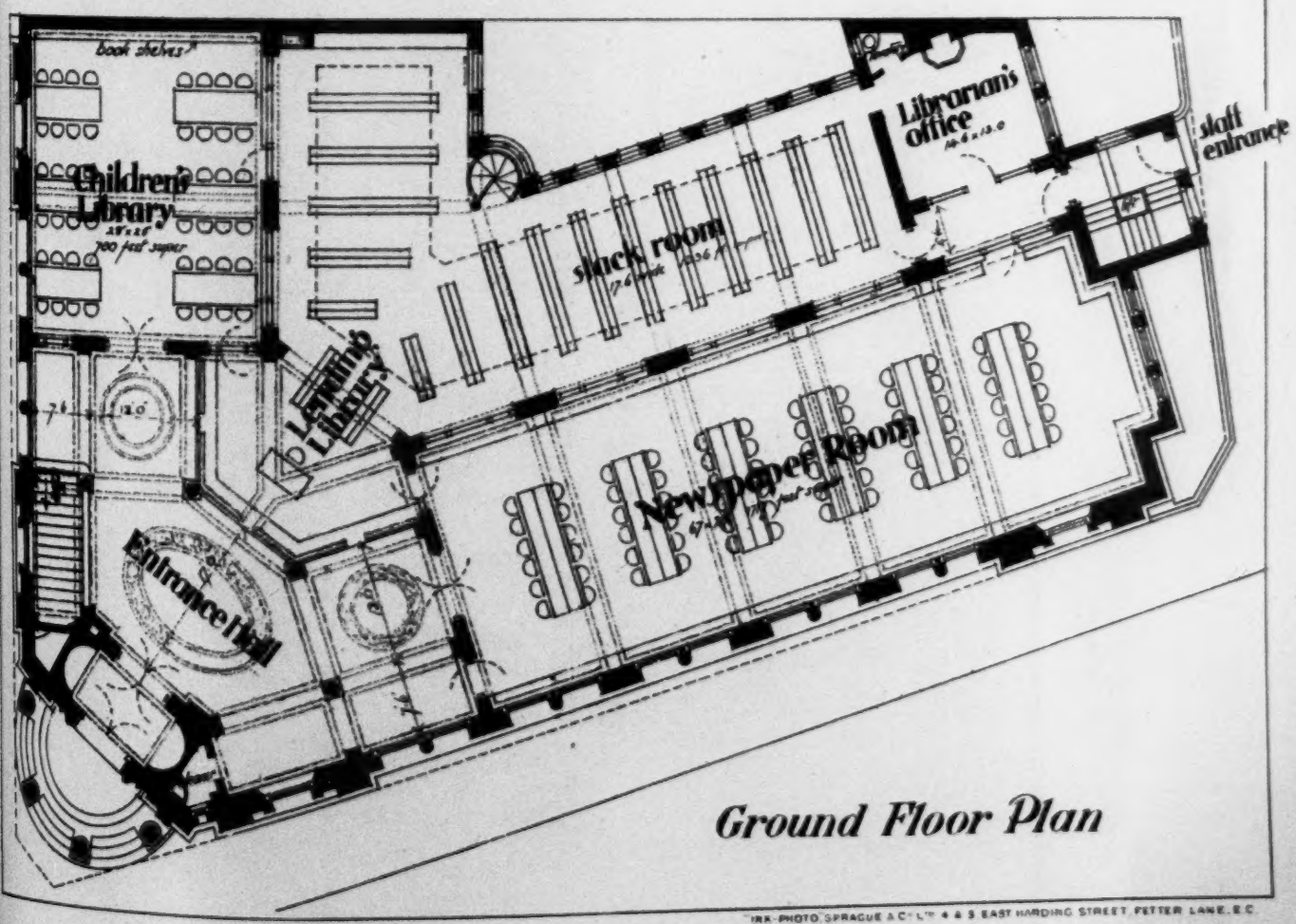
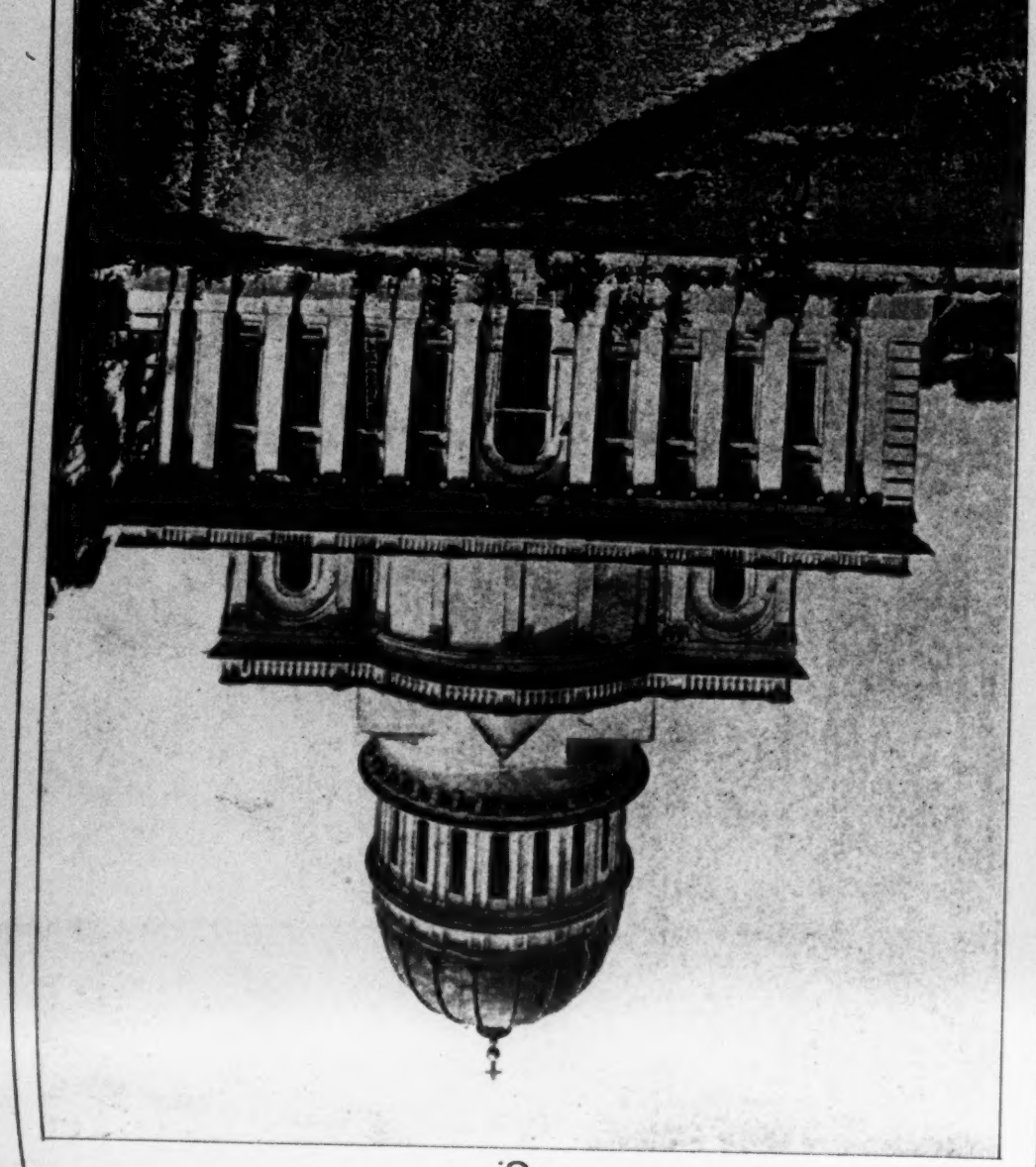


PHOTO-LITH. SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

HACKNEY CENTRAL LIBRARY COMPETITION: FIRST PREMIATED DESIGN.—By Mr. H. A. Crouch, A.R.I.B.A.

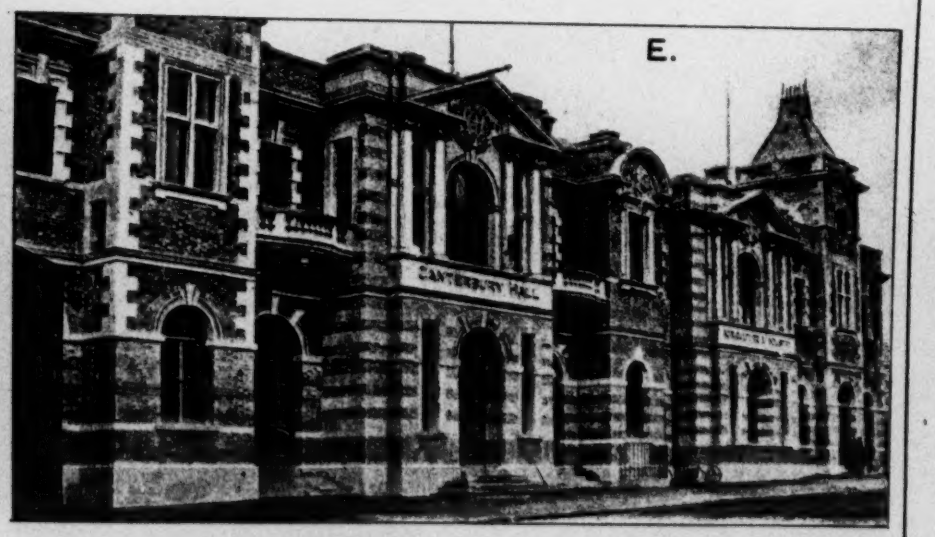
PLANS.



A.

B.

D.



E.

A. Christ Church Cathedral.
B. Supreme Court (on the Avon).
C. Catholic Cathedral.
D. Bank of Australia.
E. Canterbury Hall.

INK-PHOTO, SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

BUILDINGS IN CHRISTCHURCH, NEW ZEALAND.

Westminster Abbey, and the Chapter-house and Cloisters are also to be restored.

The Dundee Harbour Bill has passed the House of Lords.

THE Duke of Buccleuch has given his consent to Mr. Jamieson's scheme for the construction of a new open space for the people of Edinburgh, and has agreed to erect a wall in front of the Meadow Walk Parade Ground.

The Duke of Buccleuch has also given his consent to the Bill for the construction of a new bridge which has been promulgated by the Edinburgh Improvement Provisional Committee. The bridge will be 1,200 feet long, 40 feet wide, and will have a carriage-way and two foot-pavements. It will cross the Cowgate at the head of Blackfriars Wynd. Monk's Close, and Fleshmarket Close will be entirely constructed over.

The Bill has passed the House of Lords.

BUILDING NEWS.

THE Building News contains the following illustrations:—Perspective view of the Grand Hotel, Brighton, Messrs. Amon Wilds and Son, architects; Perspective view of the Grand Hotel, Scarborough, Messrs. Amon Wilds and Son, architects; Perspective view of the Grand Hotel, Eastbourne, Messrs. Amon Wilds and Son, architects; Perspective view of the Grand Hotel, Folkestone, Messrs. Amon Wilds and Son, architects; Perspective view of the Grand Hotel, Hastings, Messrs. Amon Wilds and Son, architects; Perspective view of the Grand Hotel, Bournemouth, Messrs. Amon Wilds and Son, architects; Perspective view of the Grand Hotel, Cromer

Design for Hackney Central Library. Section.

Westmorland slates, while the inside finishings are executed in fumed oak and pitch-pine.

The architect is Mr. James Findlay, of Dundee.

HACKNEY LIBRARY.

THIS design, which was placed first by Mr. J. W. Simpson, the assessor, in a recent open competition, provides accommodation for a central library which it is intended to erect at the corner of Mare-street and Paragon-street, Hackney.

The form of the plan is determined by the lines of the site, and an endeavour has been made to obtain complete supervision, by a small staff, not only of the reading-rooms but also of the public stairs and entrance. Efficient natural lighting and cross-ventilation have also been aimed at.

It is intended to face the building with Monks Park stone and red brick, while the construction will be fireproof throughout.

The architect is Mr. Henry A. Crouch.

BUILDINGS IN CHRISTCHURCH, NEW ZEALAND.

THESE illustrations, taken from photographs, are given in connexion with the first article in this issue, to which the reader is referred.

Architectural Societies.

MANCHESTER SOCIETY OF ARCHITECTS. — The eleventh meeting of this Society was held last Tuesday evening, and was presided over by Mr. Paul Ogden, F.R.I.B.A., who, after a few preliminary remarks, called upon Mr. Charles Swain to read a paper entitled "The Development of Plan." The lecturer dealt at length with the subject, and showed how in the modern planning of ecclesiastical, public, and domestic buildings there is a development from the crude design of the early and mediæval times. The lecture was illustrated chiefly by plans of the XVth century. The Chairman, in his summing-up remarks, cited further instances which clearly showed a development of plan in accordance with the views of the lecturer. Mr. Ogden felt that the books dealing with this subject were in many cases mere pretences, for they only gave plans without showing their development to that stage.

Books.

A History of English Furniture. By PERCY MACQUOID, R.I. London: Lawrence & Bullen, Ltd.; New York: G. P. Putnam's Sons. 1905.

THE second volume of this sumptuously-illustrated history commences with that period of activity in furniture production following upon the death of Oliver Cromwell in the middle of the XVIIth century. The period dealt with is spread over about eighty years, called by the author the "Age of Walnut." Walnut-trees appear to have been planted in great quantities in Elizabeth's reign, and the wood was for some time only used as a decoration in conjunction with oak; it was much used for furniture on the Continent, and by the Restoration was in general use in this country as a suitable framework for upholstered furniture. When large pieces of furniture were made throughout of walnut it is probable that the wood was imported, as in the case of oak wainscot pannelling in Elizabethan times. Oak still held its own for constructional purposes, walnut being veneered to its surface with applied mouldings in the same wood. It is not easy to find a more beautifully-marked wood than English walnut, the one objection to its use being its liability to decay by worm if neglected; this defect is probably the weightiest of those reasons which led our ancestors to adopt mahogany in its place. As a reassurance to the lovers of walnut furniture, we would point out that mahogany is also liable to decay by worm if not carefully cleaned at intervals with paraffin oil. Chapter I. contains matter relating to chairs and cabinets of the Restoration Period, a period remarkable for the fine combination of carving and turnery; the later chairs aim at graceful combinations of the lines of the various parts rather than richness of ornament, or where richness of ornament is aimed at it is obtained by velvet and silk covers of fine design. The third chapter deals with the early marquetry work of the last quarter of the XVIIth century. Mr. Macquoid shows by illustration that in cutting their marqueterie patterns the ground was not wasted; two chests of drawers are shown of the same design in which the dark wood cut away forms the ground in one and the pattern in the other. It is difficult to discriminate between foreign and English marquetry; there is no doubt much that is regarded as foreign work was made in this country, and Mr. Macquoid mentions several characteristics of the English examples. Chapter IV. deals with stools and settees; the latter show some of the most beautiful designs in structure and material of any class or period in the history of furniture. The damasks and velvets made for the purpose are most rich and fanciful in design and colour, the turning and carved scroll-work and the lines of the compositions bold, graceful, and delicate; here and there extravagance may spoil the effect as in the settee, Plate VI. As a general rule the pieces are wrought to the highest pitch of perfection; figures 71 and 72 are examples of this. The chapter also includes an account and many illustrations of the silver tables, mirrors, and furniture that were in vogue in Charles II.'s time; the custom of overlaying furniture with silver was fortunately knocked on the head by a tax on plate imposed by William III. in 1696, when no doubt great quantities of Charles II. silver furniture disappeared into the melting-pot. The next extravagance was that of Grinling Gibbons in the XVIIIth century. Both in technical excellence and beauty the wood-carving of this period excels anything produced in other countries, though it lead to no advance in construction; the realism of the decoration is out of place in serviceable pieces of furniture. It is at this juncture that the beneficial influence of architects like Sir Christopher Wren began to be felt in furniture design. Chapter V. deals with chairs and the latter marquetry, and Chapter VI. with lacquers, which became a fashionable form of decoration in the XVIIIth century, practised both by professional artists and amateurs. Chapter VII. deals with beds—enormous structures, some near 20 ft. high, hung with the richest velvets. Beds were considered by far the most important furniture in the room, and were specially described in wills of the period. The remaining chapters bring us down to Queen's Anne's reign, a prolific period of production, united with saneness of taste. They show the development of the cabriole leg and the ball-and-claw foot, the illustrations of which prepares us for the third volume, which is to deal with mahogany furniture.

Cassell's Building Construction. By Professor HENRY ADAMS, M.Inst.C.E., etc. London: Cassell & Co. 1906.

TO THE various text-books on building construction this new work is a welcome addition. Originally issued in weekly parts, the treatise now appears in the form of a handsome volume of more than 550 pages, illustrated by 2,300 blocks and twelve full-page coloured plates. The first thing to strike the eye in a preliminary examination is the thoroughly business-like manner in which the author has set about his onerous task. No space is wasted by tedious preliminary observations, and from first to last everything said is to the point. Including a brief introduction there are twenty-two chapters, each divided into paragraphs with distinctive headings, which in many cases render unnecessary any reference to the index. The latter is a specially praiseworthy feature occupying sixteen pages, and containing nearly 4,000 references. The illustrations are, without exception, reproduced from line drawings and diagrams, many of them have figured dimensions, and wherever such treatment is suitable they are drawn in accordance with a uniform system enabling the reader to identify at a glance the chief materials of construction indicated. One disadvantage we must point out is that the coloured plates are not invariably bound in appropriate positions. For example, the plate illustrating the "Five Orders of Architecture" is in the chapter on "Foundations," 500 pages away from its natural place; "Window Sashes" occur among the illustrations relating to steel girders; "Open Timber Roofs" is in the middle of the chapter on "Plumbing"; and so on. The utility of the plates is further decreased by the fact that none of them bears any reference to the text, and we have not

observed any reference in the text to the plates. It rather looks as if the binders had inserted these plates on their own responsibility without waiting for proper instructions from the author through the publishers.

So much for the general characteristics of this volume, which produces a most favourable impression at first sight. More extended study of the contents certainly confirms this impression and leads to the final opinion that in his new work Professor Adams has collected an extraordinary quantity of sound and practical information dealing with materials and methods of construction and the principles underlying building practice. It may be, as the author modestly hints, that the quality of continuity is occasionally lacking in the text But we have not observed anything of the kind that can be suggested as a defect. On the contrary, the concise and direct treatment of different points connected with each branch of work should be regarded as a recommendation. Architects and builders do not want to find practical instruction swimming in a flow of beautiful language from which it has to be fished out with persevering labour, and we feel sure they will appreciate to the full the manner in which Professor Adams has endeavoured to save their time and facilitate their studies in this encyclopædic text-book.

Structural materials, such as timber, brick, stone, lime cement, sand, iron and steel are discussed under the chapters wherein the corresponding types of construction are considered. The materials in question are not dealt with exhaustively, the manifest object of the author being to content himself with the presentation of practical notes and hints, leaving readers who require other information to find it elsewhere. All the main branches of work comprised in building construction receive very ample treatment, in which the illustrations play no inconspicuous part. Plumbing and other branches of domestic engineering are more lightly treated, and here the reader finds just enough information to make clear the necessity for studying each of these extensive subjects by the aid of a special treatise.

Having covered the essentials of building construction in the manner generally indicated above, the author has selected some of the subjects for more theoretical consideration, as shown by the chapters on "Stress Diagrams for Roofs," the "Strength of Beams and Girders," "Struts, Stanchions, and Arched Ribs," and the "Stability of Walls," and he concludes the book by a series of illustrated notes upon "Architecture." The least satisfactory chapter is that upon "Bridges," a branch of work which scarcely belongs to what is commonly recognised as "building construction," and really requires an entire volume for anything like adequate exposition. The construction of brick and masonry arches is previously discussed in connexion with these two materials, and we are inclined to think that in future editions the chapter on bridges should either be omitted altogether or modified so as to refer only to such structures as architects and building contractors are called upon to design and build. The design of railway viaducts, large highway bridges, and suspension bridges cannot be satisfactorily expounded within the limits accorded in this text-book, and the space so occupied might be devoted advantageously to the more complete discussion of small timber and steel footbridges. The same remark applies to "Wooden Bridges for 100 ft. and 200 ft. Span," a class of structure which nobody is likely to want in the present day.

There is far too much material in this book to permit anything like detailed comment upon its contents. We have indicated its general scope and salient features, and will add that Professor Adams thoroughly deserves the thanks of architects and builders for this valuable work, and that students will find in it a most useful complement to whatever text-book on building construction may be already in use as the basis of their studies.

Proceedings of the Incorporated Association of Municipal and County Engineers. Vol. XXXI. (London: E. & F. N. Spon, Ltd. 1905.)

IN the last volume of "Proceedings" issued by this Association several of the papers appeal to architects and engineers generally. Mr. H. K. G. Bamber, F.C.S., in dealing with the manufacture and testing of Portland cement could not very well say anything of much novelty, for modern methods have been repeatedly discussed at great length within the last two or three years. His paper, however, is a useful and concise epitome of present practice. Mr. Philip H. Palmer, M.Inst.C.E., contributed a short paper on "Armoured or Reinforced Concrete," summarising some of the chief points connected with the combination of concrete and steel and giving some examples of construction. Mr. A. R. Galbraith, A.M.Inst.C.E.I., read a paper on "Reinforced Concrete Piling," which deserves special commendation for the thoroughly practical manner in which the subject was treated. In discussing the important question of "Rivers Conservancy" Mr. Herbert G. Coales, A.M.Inst.C.E., certainly rose to the occasion in a very satisfactory manner, his paper being one that puts the case for reform with conspicuous lucidity. Among other noteworthy contributions are those of Mr. Albert D. Greatorex, A.M.Inst.C.E., on "Suggested Amendments to the Model Building By-laws for New Streets and Buildings"; Mr. C. H. Cooper, M.Inst.C.E., on the "Adaptation of Highways for Modern Traffic"; and Mr. Joseph Owen, on "Tramway Permanent Way Materials and Construction." The volume contains other papers, chiefly of local interest, and is well illustrated by numerous plates of diagrams.

Industrial Efficiency: A Comparative Study of Industrial Life in England, Germany, and America. By ARTHUR SHADWELL, M.A., M.D. In two vols. London: Longmans & Co. 1906.

THE prosperity of a nation must largely depend on its industrial efficiency—in other words, on the capacity of its men and its machines for the work which they have to do. Such an examination, therefore, as that which Dr. Shadwell set himself to accomplish, and the results of which are contained in these two interesting volumes, is of the first importance. Scientific in intention, this book, when it is carefully examined, is somewhat loose both in analysis, reasoning, and conclusions, one, and the main one, of which is that England in some respects has been industrially outstripped by her rivals. But because a nation has been able to surpass an older society in some respects it gives no cause for fear, because industrial progress depends on many circumstances connected with climate and so forth. But unquestionably a perusal of this book will enable those who are interested in the subject which it treats to better understand some of the factors of international industrial competition. Some of these are personal, others political; some depend on education, and some on long-standing social conditions. The book is one to be read and to be pondered over.

BOOKS RECEIVED.

THE LONDON BUILDING ACTS, 1894 TO 1905. By E. A. Cohen, Barrister-at-Law. (Stevens & Sons. 25s.)

THE ARCHITECTURAL ASSOCIATION SKETCH-BOOK. Edited by W. G. B. Lewis and Theodore Fyfe. Vol. IX. (The Architectural Association.)

MEDIÆVAL RHODESIA. By D. Randall-Maciver, M.A., F.R.G.S. (Macmillan & Co. 20s.)

DORCHESTER (DORSET) WITH ITS SURROUNDINGS. (The Homeland Association. 1s.)

REASON AS A BASIS OF ART. By C. F. A. Voysey. (Elkin Mathews. 1s.)

Correspondence.

FERRO-CONCRETE.

SIR,—The great interest that is now evident amongst engineers and architects in all that relates to this subject, owing principally to the enterprise of agents for several foreign systems of ferro-concrete construction, should not be allowed to obscure the work of a pioneer of the system, Mr. Hyatt, over a quarter of a century ago.

Those who are interested in the early history of the system should refer to the pages on fire-proofing in a work on the "Fire-resisting Arrangements of Factories, Workshops, etc.," by B. H. Thwaite, C.E., published by Spon in 1882. The method of utilising concrete not only as a metallic preservative but also as an agent of compressional strength, is clearly shown, so that in simple justice to Hyatt his work should be remembered.

T-SQUARE.

PULPITS AT RAVELLO.

SIR,—A correspondent kindly points out to me that the Latin inscription referring to the date of Duomo pulpit reads:—

". . . . *Lapis, Millenis, Bis Centum, Bisque Trisenis Christi Bissenis,*" etc.

"Thrice six" should, therefore, have been "twice six," making the date 1272.

It is also pointed out to me that authorities upon these matters are agreed that the pulpit in "San Giovanni Del Toro" is anterior to the one in Duomo, and probably dates from prior to 1154.

This may be a correct surmise, but for my own part I must say that, after carefully examining and comparing the two pulpits as to the treatment, design, and colour of the mosaic, I came to the conclusion that parts were either copied the one from the other, or were by the same hand, and since an artist of Nicolas de Bartolomeo's ability would hardly copy, I prefer to think that they are by the same man. Moreover, mosaic work at Salerno, etc., dating from 1150 (about) has quite a different appearance, upon careful examination and comparison.

LIONEL U. GRACE.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XI.

CUBE ROOT—HIGHER ROOTS.

WHILE most people are able to solve square roots with reasonable facility, there are many who cannot deal with cube roots without adventitious aid of some kind.

Architects and contractors generally have at hand in their offices mathematical tables facilitating the extraction of cube roots, but as calculations sometimes have to be performed without other appliances than a piece of paper and a pencil it is really desirable that the arithmetical process should not be entirely neglected.

The methods for extracting the cube root of a number are analogous to those for extracting the square root.

By the method of factors it is frequently possible to find the cube root of a number by mere inspection.

Thus it is easy to detect the fact that $216 = 8 \times 27$, and still more easy to recognise that $8 \times 27 = 2^3 \times 3^3 = (2 \times 3)^3$.

Consequently the cube root of 216 is seen to be $\sqrt[3]{(2 \times 3)^3} = 2 \times 3 = 6$.

Again, it is not difficult to see that 2744 is divisible by 8, giving 343 as quotient, which is divisible by 7 with 49 as quotient.

Then as $8 = 2^3$, and as $7 \times 49 = 7^3$, the cube root of $2744 = \sqrt[3]{2^3 \times 7^3} = 14$.

Of course, the convenience of this method depends a good deal upon the readiness with which numbers can be split up into prime factors, and the extent to which analysis of the kind can be usefully applied depends a good deal upon the facility of the operator.

***Example* (1):** Find by the method of factors the cube root of 13824.

Referring to the tests of divisibility given in Article X., p. 296, we find that 8 is a factor of 13824, as the last three figures are divisible by 8.

Therefore

$$13824 \div 8 = 1728$$

As the last three figures of 1728 are again divisible by 8 we have

$$1728 \div 8 = 216.$$

We have already seen that 216 can be resolved into 8×27.

Therefore the factors of 13824 are

$$(8^3 \times 27) = (2^3 \times 3^3)$$

and we get

$$\sqrt[3]{13824} = \sqrt[3]{(2^3 \times 3^3)} = (2^3 = 3) = 24$$

***Example* (2):** Find by the method of factors the cube root of 4492125.

By the tests of division in Article X., p. 296, we find that 5 is a factor of 4492125 as the last figure is 5, and similarly is a factor of the two succeeding quotients.

Therefore

5)4492125

5)898425

5)179685

35937

Next adding the figures $3 + 5 + 9 + 3 + 7 = 27$, we find that 9 is a factor,

Whence $35937 \div 9 = 3993$.

As 3993 is obviously divisible by 3, we have $3993 \div 3 = 1331$.

As the difference between the figures in the odd and even places of $1331 = (1 + 3) - (3 + 1) = 0$, we have 11 as a factor, and for the same reason as a factor of each successive quotient.

Thus

11)1331
11)121
11)11
1

Collecting the factors ascertained above, we have

$5 \times 5 \times 5 = 5^3$
$9 \times 3 = 3^3$
$11 \times 11 \times 11 = 11^3$,

and

$\sqrt[3]{449.125} = \sqrt[3]{(5^3 \times 3^3 \times 11^3)}$
$= 5 \times 3 \times 11$
$= 165$

The general rule for the extraction of cube root by the ordinary method is as follows:—

Rule (1).—(*a.*) Mark off in groups of three the figures of the number whose cube root has to be found, commencing from the right hand, by dots or commas. If the number includes a decimal fraction, mark off the figures of the fraction in a similar manner commencing from the decimal point, and in cases where there are not enough decimals to complete the last period, add either one or two ciphers as necessary.

(*b.*) Find the highest figure whose cube does not exceed the first period of the dividend. The figure so found is the first figure of the required root or "quotient," and its square is the first "divisor." Denoting by the symbol (a_1) the first figure of the root, the first divisor $= a_1^2$.

(*c.*) After division of the first period append to the remainder the next period of the number or "dividend," and divide by a number consisting of the sum of the three following products:—

(1) $300 \times$ (quotient already found)^2,
(2) $30 \times$ (quotient already found) $\times$ (new figure of quotient).
(3) (new figure of quotient)^2.

After division, bring down the remainder and proceed as before until the exact cube root or a sufficiently exact approximation has been obtained.

Note.—It will facilitate operations to remember that the form of successive divisors, expressed algebraically, is

$300a_1^2 + 30a_1 b_2 + b_2^2$
$300a_2^2 + 30a_2 b_3 + b_3^2$
$300a_3^2 + 30a_3 b_4 + b_4^2$
$300a_4^2 + 30a_4 b_5 + b_5^2$
and so on,

where the index figures against a denote the *number of figures* in the quotient, and the index figures against b denote the *numerical order of the figures* in the quotient.

Further, it will facilitate the determination of b in each divisor to employ a trial divisor consisting of 300 times the square of the quotient already found, or expressed algebraically, $300a_1^2$, $300a_2^2$, $300a_3^2$, and so on.

Example (1): Find the cube root of 823128·75 to three places of decimals.

After marking off the periods to the left of the decimal point, adding one cipher to complete the period to the right of the decimal point, and adding two complete periods of decimals, we proceed in accordance with Rule (1), as follows:—

$a_1^2 =$ 81)823,128 750,000,000(93714 = 93·714
729

$300a_1^2 + 30a_1 b_2 + b_2^2 =$ 25119)94128
75357

$300a_2^2 + 30a_2 b_3 + b_3^2 =$ 2614279)18771750
18299953

$300a_3^2 + 30a_3 b_4 + b_4^2 =$ 263418811)471797000
263418811

$300a_4^2 + 30a_4 b_5 + b_5 =$ 26345816836)108378189000
105383267344

2994921656

The manner in which the various divisors (1) to (5) are obtained is given below.

9^2	=	81	81
300×9^2	=	24300	
$30 \times 9 \times 3$	=	810	
3^2	=	9	25119
300×93^2	=	2594700	
$30 \times 93 \times 7$	=	19530	
7^2	=	49	2614279
300×937^2	=	263390700	
$30 \times 937 \times 1$	=	28110	
1^2	=	1	263418811
300×9371^2	=	26344692300	
$30 \times 9371 \times 4$	=	1124520	
4^2	=	16	26345816836

Horner's method provides an expeditious alternative to the ordinary process for extracting the cube root of a number. To avoid a lengthy explanation this method is explained by the aid of an example in which we use the same number as in example (1).

Example (2): Find by Horner's method the cube root of 823128·75 to three places of decimals.

After marking off the periods to the left and right of the decimal point and adding the necessary ciphers as in example (1), three columns are commenced for the convenient calculation of the successive divisors, beginning column I. with 1, column II. with 0, and column III. with 0. The number whose cube root is required forms a fourth column, but we have here placed the number and the successive processes of division first, and the columns wherein the successive divisors are calculated below the final working.

81)823,128·750,000,000(93714 = 93·714
729

25119)94128
75357

2614279)18771750
18299953

263418811)471797000
263418811

26345816836)108378189000
105383267344

2934921656

	Col. (I.)	Col. (II.)	Col. (III.)
I.	1	0	0
II.		(2) 9	(2) 81 (1st divisor)
		(1) 9	(5) 162
		(3) 18	(2) (4) 24300 (2nd trial divisor)
		(3) 9	(7) 819
		(3) (4) 270	(7) 25119 (2nd divisor)
III.		(6) 273	(2) (6) 2594700 (3rd trial divisor)
		(1) 3	(7) 19579
		(1) 276	(7) 2614279 (3rd divisor)
		(3) 3	19628
		(3) (4) 2790	263390700 (4th trial divisor)
		(6) 7	28111
IV.		(6) 2797	263418811 (4th divisor)
		7	28112
		2804	26344692300 (5th trial divisor)
		7	1124536
		28110	26345816836 (5th divisor)
		1	
V.		28111	
		1	
		28112	
		1	
		281130	
		4	
		281134	

The Roman numerals in the margin above, and the small index figures against some of the numbers under columns II. and III. refer to similar numerals and figures in the subjoined explanation.

I.—A. (1) The first period to be dealt with is 823, and as the cube next below this number has the cube root 9 we place the figure 9 as the first figure of the cube root or "quotient."

B. (2) We multiply the 1 in column (I.) by the first figure of the quotient and write the product 9 in column (II.)

(3) Next we multiply the product 9 by the first figure of the quotient (9×9), and write in column (III.) the product 81, which is the first divisor.

(4) Then after using 81 as a divisor we subtract the product, $81 \times 9 = 729$, from the first period of the number or "dividend," and bring down the next period.

II.—A. (1) We multiply the 1 in column (I.) by the first figure of the quotient and write the product 9 in column (II.) below the sum 9 previously obtained.

(2) Next we multiply the sum of the figures in column (II.) by the first figure of the quotient, $18 \times 9 = 162$; writing this number in column (III.), and adding in the sum 81 already there, we get the sum $162 + 81 = 243$.

(3) Then we multiply the 1 in column (I.) by the first figure of the quotient and add the product 9 to column (II.), giving the sum 27.

(4) At the right of the 27 last written in column (II.) place one cipher, making the amount read 270; at the right of 243 in column (III.) we add two ciphers, making the amount read 24300.

(5) The number 24300 in column (III.) is now the trial divisor for determination of the second figure in the quotient. As the divisor evidently goes only 3 times into 94128 in the dividend we write 3 as the second figure of the quotient.

B. This figure 3 is used in the same manner as was the first figure of the quotient, as briefly indicated below.

(6) The 1 in column (I.) $\times 3 = 3$ is added to 270 in column (II.), giving 273.

(7) Then $273 \times 3 = 819$ is added to 24300 in column (III.), giving 25119, which is the second divisor.

(8) Then using 25119 as the divisor, we subtract the product $25119 \times 3 = 75257$ from 94128 in the dividend and bring down the next period.

III.—A. To obtain the trial divisor for the dividend now to be dealt with, we proceed as in II. A.

Thus:—

(1) $1 \times 3 = 3$ is added to the total of column (II.), giving 276.

(2) $276 \times 3 = 828$ is added to the total of column (III.), giving 25947.

(3) $1 \times 3 = 3$ is added to column (II.), giving 279.

(4) 279 with one cipher added = 2790, and 25947 with two ciphers added = 2594700.

(5) The trial divisor is 2594700, and indicates 7 as the next figure of the quotient.

B. The actual divisor is obtained as in II. B.

(6) The 1 in column (I.) $\times 7 = 7$, which added to 2790 in column (II.) gives 2797.

(7) Then $2797 \times 7 = 19579$, which added to the number in column (III.) gives 2612479 as the third divisor.

(8) Then after using the divisor, we subtract and bring down the next period.

IV.—The operations in II. and III. are repeated, giving the divisor 263418811, as shown.

V.—The operations in II. and III. are again repeated, giving the divisor 26345816836, as shown.

From the above working and explanation it may appear at first sight that the extraction of a cube root by Horner's method is a somewhat complicated process. In reality, it is quite simple, but, as everybody knows, the explanation of a most simple thing is frequently a most complex operation. The apparent complication is further increased by the number of figures and the decimal fraction in the number chosen for example (2).

In order to illustrate the facility with which Horner's method can be used, we give below an example of evolution applied to a number such as architects may have occasion to deal with when separated from their accustomed books of reference.

Example (3): Find by Horner's method the cube root of 175516.

Col. (I.)	Col. (II.)	Col. (III.)	
1	0	0	175,616(56
	5	25	125
	5	25	50616
	5	50	50616
	10	7500	
	3	936	
	150	8436	
	6		
	156		

Therefore the required cube root = 56.

In preparing columns (II.) and (III.) it will be found better to perform the various multiplications mentally, writing down only the results of the several additions. Similarly, in the column devoted to the final working the Italian method of writing down only the differences may be adopted with advatage.

By these modifications the above workings would then appear thus:—

Col. (I.)	Col. (II.)	Col. (III.)	
1	0	0	175,616(56
	5	25	
	10	75	50,616
	156	8436	

Applications of Cube Root.

Example (1): Find the dimensions of a cubical tank capable of holding 2,000 gallons of water.

As 1 cubic foot = 6·23 gallons, we have

$$2{,}000 \div 6{\cdot}23 = 321{\cdot}02, \text{ say } 321 \text{ cubic feet.}$$

$$\sqrt[3]{321} = 6{\cdot}84 \text{ ft., say } 7 \text{ ft.}$$

Then the inside dimensions of the tank will be

$$7 \text{ ft.} \times 7 \text{ ft.} \times 7 \text{ ft.}$$

Example (3): Find the dimensions of a rectangular bin whose length, breadth, and depth respectively are as 3 : 1½ : 1, and whose capacity shall be equal to 1 ton of Portland cement.

Taking the weight of Portland cement at 90 lb. per cubic foot, we have

$$\frac{20 \times 112}{90} = 24{\cdot}88, \text{ say } 25 \text{ cubic feet.}$$

Considering the specified proportionate dimensions it is evident that the bin can be divided into thirty-six equal cubical parts, each representing $\frac{25}{36} = 0{\cdot}695$ cubic feet.

The sides of these small cubes will measure

$$\sqrt[3]{0{\cdot}695} = 0{\cdot}885 \text{ ft.}$$

Hence the dimensions of the bin will be:—

Depth = (0·885 × 2) × 1 = 1·77 ft.
Breadth = (0·885 × 2) × 1½ = 2·65 ft.
Length = (0·885 × 2) × 3 = 5·30 ft.

Example (3): Find the inside diameter of a semi-spherical boiling pan with the specified capacity of 200 gallons.

Here

$$200 \div 6{\cdot}23 = 32{\cdot}1 \text{ cubic feet.}$$

The volume of a sphere = $\frac{4}{3} \times 3{\cdot}1416$ times the cube on its radius.

Whence

$$r = \sqrt[3]{\frac{\text{capacity}}{\frac{4}{3} \times 3{\cdot}1416}}$$

As we are here dealing with a semi-spherical vessel we must double the capacity for the purpose of calculation.

Then the radius will be

$$\sqrt[3]{\frac{2 \times 32{\cdot}1}{\frac{4}{3} \times 3{\cdot}1416}} = 2{\cdot}5 \text{ ft. (nearly).}$$

And the diameter = 2·5 × 2
= 5·0 ft.

Higher Roots.

Methods exist for extracting higher roots, but they are not used in practice.

The following relations, however, should be remembered, as they can often be applied with convenience:—

4th root = $\sqrt{\text{square root.}}$
6th ,, = $\sqrt[3]{\text{square root.}}$
8th ,, = $\sqrt{\text{fourth root.}}$
9th ,, = $\sqrt[3]{\text{cube root.}}$
12th ,, = $\sqrt[3]{\text{fourth root.}}$

THE T-SQUARE CLUB.—The T-Square Club held a concert last Tuesday at the Café Monico, when the chair was occupied by Sir Aston Webb. There was a good attendance, and the programme consisted of vocal and instrumental music by members of the club and others. During the interval, Mr G H Fellowes-Prynne proposed a vote of thanks to the Chairman, and remarked that Sir Aston Webb was a man of many capacities, who entered not only into their work, but sympathised with and joined them in their lighter moments of pleasure. Most of those present had benefited by the influence of his work or kind words, and he (Mr. Prynne) asked them to accord Sir Aston Webb a hearty vote of thanks for spending the evening with them. The vote was carried with musical honours. Sir Aston Webb, in reply, said he had greatly enjoyed the delightful entertainment, and the obligation really lay on his side for the privilege of being present.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the managers of the Metropolitan Asylums District was held on Saturday last week at the offices, Victoria-embankment.

New Central Stores.—On the recommendation of the Finance Committee it was agreed to apply to the Local Government Board for an order authorising the expenditure of a sum not exceeding 18,000*l.* on the erection of the New Central Stores, the money to be repayable within thirty years.

South-Western Hospital.—It was agreed, on the recommendation of the Hospitals Committee, to install warming apparatus in certain parts of the lower administrative block of this hospital. The cost is estimated at 230*l.*, and the matter was referred to the Works Committee to be dealt with.

Caterham Asylum.—The Works Committee submitted a plan of a proposed upholsterers' shop at this asylum, and it was agreed to forward the plan to the Local Government Board for sanction.

South-Eastern Hospital.—On the recommendation of the same committee it was agreed that certain defective drains at this Hospital should be replaced with cast-iron drains at a cost of 95*0l.*, the work to be an "extra" upon Messrs. Godson & Son's contract for the reconstruction of the hospital.

Darenth Asylum.—The Asylum Committee submitted a lengthy report from the Darenth sub-committee regarding the proposed new workshops and fire-station at this asylum, the matter having been referred back to the Committee for further consideration last December, owing to the Local Government Board asking for further information. The sub-committee's report stated that the scheme provided for the following accommodation:—

On lower level—shops for upholsterers, shoemakers, painters, and plumbers. On higher level—shops for carpenters (industrial) and tailors, and for mat-making, brush-making and basket-making industries, a mess-room for artisans, five water-closets, a room for fire apparatus, and a fire-escape shed. The building would be on sloping ground, which would necessarily enhance its cost. It would be bisected by the main corridor at the northern end of the male staff blocks nearest to the training-school. A new and up-to-date fire-station was included in the scheme, this station being a very necessary proposal in view of the size of the whole institution.

It was proposed that the yard (both high and low level) should be covered in with a glass roof in order that patients could work out in the yard in mild weather; this augmenting the cost of the scheme very considerably.

Having regard to the importance of the industrial work now being carried on at Darenth under somewhat adverse conditions, it was imperative that properly-constructed workshops, sufficiently large to admit of an increasing number of persons to work therein, should be provided with the least possible delay, in order to ensure the continued success of the industrial operations now being carried on by a large number of patients under the supervision and guidance of competent trainers.

The cost of the building worked out at the low price of 6d. per cubic foot.

It was decided to forward a copy of the report to the Local Government Board.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

International Congress of Architects.—A letter was received from the President and Secretary of the Seventh International Congress of Architects, London, 1906, inviting the Corporation to appoint two delegates to attend the Congress.

Tar Paving.—The City of London Schools Committee were authorised to renew the tar paving of the playground of the City of London School, at a cost not exceeding 400*l.*

Re-wiring of the Guildhall.—Permission was given to the City Lands Committee to proceed with a further section of the work of the electrical re-wiring of the Guildhall, and to expend a sum not to exceed 500*l.* during the present year.

Improvement of the Guildhall.—Mr. William Rome moved that, with a view to restoring the Guildhall to its original beauty and impressiveness, it be referred to the City Lands Committee to consider and report on the desirability of removing from the walls and columns of the interior of the hall the plaster or stucco with which they have been incrusted and disfigured, and probable cost. Mr. Cooper hoped that it was not Mr. Rome's intention to deal with the interior of the Great Hall in the way he had dealt with the porch. Mr. Deputy Ellis said that the whole question was considered by the City Lands Committee in 1903. In reply Mr. Rome stated that the Guildhall porch excited general admiration among those who were capable of forming an opinion now that the stucco had been removed. Mr. Seymour Lucas, R.A., had told the City Lands Committee that the Guildhall was one of the finest halls in the country, but that its beauty had been destroyed by plaster and stucco, the removal of which he strongly recommended so that the ashlar work beneath might be seen. The motion was adopted.

Obituary.

MR. HUNTER.—The death, on February 26, is announced of Mr. Adam Hunter. Mr. Hunter was taken into partnership in April, 1904, by Mr. J. M. Porter, under the style of Messrs. J. M. Porter & Hunter, of the Estate Office, Colwyn Bay, architects, surveyors, etc. The firm were architects of the Free Library in Woodland-road, Colwyn Bay, of a house and stabling at Groes Field for Mr. Richard Wood, and of a house in the same neighbourhood for Mr. G. Mould. A few months ago Mr. Hunter passed the Special Examination of the Institute of Architects, and his name was on the list for election as an Associate.

MR. T. BRETTELL.—On the 9th inst. the death was announced of Mr. Thomas Brettell, surveyor and mining engineer, which took place at his residence at Dixon's Green, Dudley, at the age of sixty-nine. The deceased gentleman was for several years surveyor to the old Sedgley Local Board.

General Building News.

WESLEYAN CHURCH EXTENSION, SOUTHAMPTON.—The memorial-stones of the extension of the Wesleyan church and school at Bevois Town have just been laid. The cost of the scheme is estimated at 3,000*l.* The school has already been improved and the accommodation has been increased, and the whole of the buildings will be modernised. The new buildings have been planned to harmonise with the present structure, and a guild-room, classroom, etc., have been so arranged as to form a connecting-link between the Sunday schoolroom and the church, which were formerly two separate buildings. They will be faced with red brick and Bath stone dressings, with pitch-pine wood block floors, cement dadoes, and plastered walls and ceilings. The porch on the Bevois Valley side will contain a new stone staircase to the gallery, and will be carried up to form a tower, terminating with a spire. The old vestries at the north end of the church have already been demolished, and the organ and rostrum have been removed. It is proposed to build a chancel, with Gothic arches between the choir gallery and the body of the church. Under the choir gallery is to be placed the minister's vestry and the choir vestry. The church is to be reseated throughout with modern seats of pitch-pine. The whole of the buildings are to be heated on the low-pressure hot water system, partly by pipes and partly by radiators, and the ventilation will be improved. The lighting is to be rearranged, and the buildings redecorated throughout. Mr. G. E. Smith, of Portswood, is the architect, and Mr. H. Jones the builder.

PARISH CHURCH, FORRES.—The new parish church at Forres was opened a short time ago. The building was erected from plans by Mr. John Robertson, architect, of Inverness, and the following were the contractors:—Mason, Mr. Alex. Cameron, Inverness; carpenters, Messrs. A. & R. Dunbar, Elgin; slater, Mr. Davidson, Elgin; plasterers, Messrs. Angus & Rees, Forres; plumbers, Messrs. Boyne & Martin, Forres; painter and glazier, Mr. James Robertson, Forres; heating, Messrs. M'Kenzie & Moncur, Edinburgh; pulpit, Messrs. Hardman, Powell, & Co., Birmingham; choir, chancel steps, and holy table, Messrs. Galbraith & Winton, Glasgow; baptismal font, Messrs. Stewart M'Glachan & Co., Edinburgh; organ, Mr. R. Lawton, Aberdeen; lectern, Messrs. Jones & Willis, London. The inspector of the works was Mr. J. W. Dorrell.

PRIMITIVE METHODIST CHURCH, ASHBY.—The foundation-stones of the new Primitive Methodist Church, on Burton-road, Ashby, were laid recently. The cost of the building will be about 2,200*l.* The contractors are Messrs. Orton & Son, Ashby, and the architect is Mr. Harry Smedley, of Ashby.

SECONDARY SCHOOL FOR GIRLS, MACCLESFIELD.—It is proposed to erect a new Secondary School for Girls in Fence-avenue, Macclesfield, from plans prepared by Mr. H. Beswick, county architect, Chester.

PROPOSED RESTORATION OF SILK WILLOUGHBY CHURCH.—Mr. Hodgson Fowler, in a report on the condition of this church, states that new roofs are absolutely necessary, and he proposes to lower the aisle walls about 3 ft. 6 in., so as to get roofs of a moderate pitch. The colour wash inside the church needs removing, and he proposes to lay a bed of cement concrete over the whole area, replacing the present stone flooring as far as possible in its present condition, and replacing decayed timber in the wooden floor with new oak.

The old oak seats with their richly carved bench ends need careful repair, and so does the chancel screen. These various works, with other repairs of masonry, glazing, and other fittings, are estimated to cost 2,810*l*. Mr. Hodgson Fowler has prepared the plans for the proposed restoration.

CHURCH RESTORATION, LINCOLN.—The church of St. Peter-at-Arches, Lincoln, was re-opened a short time ago after having undergone restoration. The work was carried out under the direction of Mr. Gamble (of Messrs. W. Scorer & H. G. Gamble, Lincoln).

VARIETY THEATRE, CARLISLE.—The new Palace Theatre of Varieties in Botchergate has just been opened. The seating accommodation is for about 1,400. Messrs. Owen & Ward, Birmingham, were the architects for the work.

CLUB PREMISES, BURTON.—The premises which have served the purpose of the General Post Office in High-street have been purchased with the object of forming club premises for the Unionist Party in Burton. The existing front of the premises will remain unaltered. The main portion of the ground floor area will be taken up by a lecture-hall, about 58 ft. by 26 ft. A refreshment bar is provided for this lecture-hall. The main staircase leads from the ground floor entrance-hall to the first floor only, on which are placed the billiard-room, reading or card room, a supper-room, and a bar. The top floor is reached by the steward's stone staircase, and provides a kitchen, scullery, two bedrooms, bath, lavatory, water-closet, pantry, and a private room for the secretary. There is a range of lavatories in connexion with the lecture-hall on the ground floor, and another for the billiard-room, etc., on the first floor. The lighting will be by electric lamps, and the buildings will be heated by hot water on the low-pressure system. Open fireplaces are also provided in each room. The contractors are Mr. Geo. Hodges for the general buildings; Mr. T. W. Biddulph, plastering; Messrs. T. Perkins & Sons, plumbing; Mr. H. Lea, painting; Mr. Thomas Jenkins, of Burton, is the architect.

PARISH ROOM, ST. LAWRENCE, IPSWICH.—A parish room has just been erected at St. Lawrence, Ipswich, at the rear of St. Stephen's parish-room, with entrance from St. Stephen's-lane. It is of red brick, and Gothic in style; the length of the main hall is 60 ft., and the width 27 ft. Messrs. Brown & Burgess were the architects, and Mr. Sidney Kenney the builder.

INSTITUTE PREMISES, WAKEFIELD.—Lady Constance Milnes Gaskell recently laid the foundation-stone of the Wakefield Social Institute. The scheme includes the provision of a lecture or concert hall to accommodate 200 persons, a billiard-room with three tables, a room for physical exercises, reading, writing, and smoking rooms, a small tea-room, and a refreshment buffet, as well as the usual offices. The work is being carried out from plans prepared by Mr. Abraham Hart, architect.

BANK PREMISES, YARMOUTH.—New premises have been erected on the Quay at Yarmouth for the National Provincial Bank of England. The architect was Mr. A. S. Hewitt, of Yarmouth, the general contractors being Messrs. Ellis & Dodman, of Lowestoft. Mr. Potter, Norwich, was responsible for the stone work; the ornamental plastering and decoration was by Mr. W. G. Crotch, of Norwich; the electric light installation by Messrs. Bowers & Barr (Yarmouth); the heating apparatus was supplied by Mr. R. A. Pank (Yarmouth); the mosaic and teak floors were fixed by Mr. J. F. Ebner (London); and the furnishing of the manager's room, etc., was entrusted to Messrs. Palmer Bros., of Yarmouth.

RIVERSIDE DEPOT, SOUTHWARK.—Greenmore Wharf, Bankside, was opened by the Mayor of Southwark on the 10th inst. as a riverside depot of the Southwark Borough Council for the Northern end of the borough. It contains stables with forty-six stalls, two loose boxes, fodder store, a store for loose implements, and a cement store capable of holding about 100 tons of cement, offices, ballast bays, storage for vans, etc. The floor of the cement store is fixed at the height of a cart, so that the cement can be loaded in the cart without the necessity for lifting. Attached to the stable buildings there is also a basement and office facing Bankside. The cost of the work carried out, including the purchase-money of this portion of the ground, is 54,207*l*. 12*s*. 6*d*. Mr. Arthur Harrison, the Borough Engineer, acted as architect and quantity surveyor, and the builders were Messrs. Higgs & Higgs.

HYDRO HOTEL, RIPON SPA.—The plans of Mr. Sydney D. Kitson, M.A., architect, of Leeds, which were placed first in the recent competition by Mr. Woodhouse, of Manchester, the assessor, have been adopted by the directors of the Spa Hydro. The existing house of Elmscrofts has been taken as the nucleus of the scheme, and it is intended to produce two wings at an obtuse angle with the main point, thus catching all the south sun. The east wing, which will run parallel with the boundary of the Spa Gardens, will consist of one large room on the ground floor, some 70 ft. by 35 ft., the whole of which will ultimately form the dining-room. There will be a new service wing to the north, and another wing will be thrown out at the back to form a Turkish bath. The roof of the existing building will be raised and modelled and surmounted by a balustrade and lantern.

ARCADE, NEWCASTLE.—An arcade is in course of construction in the triangular pile of buildings lying between Grainger, Market, and Grey streets, Newcastle. The plans for the work were drawn by Messrs. J. Oswald & Son, and the cost of the scheme will be about 40,000*l*.

HOTEL, ABERAVON.—The new Vivian Hotel, at Aberavon, which has just been opened, is situated in Victoria-road, Station-road, and Cross-road. Mr. Morgan Cox, Aberavon, was the builder, and the architect was Mr. Rowlands, of the firm of Messrs. J. P. Jones & Rowlands, Swansea.

THE WANDLE SCHOOL, WANDSWORTH.—The Wandle School, built by the London County Council at Dunt's Hill, Wandsworth, was opened for the admission of children last January. The school consists of two structures, one of three stories arranged for mixed departments, and the other a one-story building for infants. Accommodation is provided for 1,140 children. In the mixed school accommodation has been provided on the ground floor for 376 junior scholars in eight classrooms, and a central hall, 57 ft. 9 in. by 26 ft., together with the necessary cloak-rooms and lavatory accommodation. On the first floor similar accommodation is provided for a like number of senior scholars, while on the second floor are the drawing classroom and the science-room. The teachers have rooms provided for them on the mezzanine floors. The smaller building has accommodation for 388 infants in eight classrooms and a central hall, 54 ft. by 26 ft. 6 in. Cloak-rooms and lavatory accommodation for the children, and rooms for the head mistress and the teachers are also provided. Both buildings are warmed by low-pressure hot-water systems, with heating chambers in the basements; and they are ventilated by means of fresh air inlets in the angles of the classrooms, and extracts at the ceiling levels. It is proposed to provide in the separate building in the boys' playground a manual training centre for forty students. The buildings are of simple design, with stock brickwork and red brick dressings, the doorways, balustrades, etc., being in Portland stone; they have been erected from the designs and under the superintendence of the Council's architect (Education), Mr. T. J. Bailey. The contractors are Messrs. Holliday & Greenwood, Ltd., whose tender amounted to 23,337*l*. The cost of the site, including legal charges, amounted to 3,800*l*., and the cost of furnishing to 850*l*., making a total cost of 27,987*l*.

Stained Glass & Decoration.

NEW ALTAR AND THRONE, EXETER.—The high altar and reredos at the Church of the Sacred Heart, Exeter, have been completely transformed during the past three months. The reredos, which was formerly built in a straight line across the sanctuary, has been taken down and reconstructed to fit the apsidal shape of the sanctuary. The old throne, with the canopy over, has been renewed, and the altar is entirely new. The tabernacle has been carried out by Mr. A. B. Wall, sculptor, of Cheltenham, under the personal instructions and from the designs of the Very Rev. Canon Scoles and Mr. Raymond, joint architects, of Basingstoke.

Appointments.

AUCKLAND, NEW ZEALAND.—The appointment is announced as City Engineer, Auckland, at a salary of 1,000*l*. per annum, of Mr. W. E. Bush, Borough Engineer and Surveyor of Sudbury, Suffolk. There were a large number of applicants for the post.

ARMSTRONG COLLEGE, NEWCASTLE.—The Council unanimously appointed Dr. W. M. Thornton to the newly-established Professorship of Engineering at their meeting on March 19. Dr. Thornton is a Master of Engineering and Doctor of Science, Liverpool University College, and Doctor of Science, Victoria University, Manchester. When a student at Liverpool, 1892-6, he won the University scholarship for physics, gained the first places in "honours" for engineering and physics, and was a "special scholar" in electricity. He was during two years senior lecturer on engineering at University College, Bristol, and is the inventor of instruments for measuring and indicating the strength of electrical currents in cables, etc.

Sanitary and Engineering News.

SANITARY APPARATUS AND THE PUBLIC HEALTH ACT.—The decision in London and South-Western Railway *v.* Hills should be noted. The County Council has powers under sect. 39 of the Public Health (London) Act, 1891, to make by-laws with respect to water-closets, etc., and the proper accessories thereof in connexion with buildings whether constructed before or after the passing of the Act. Under this section the authority had made a by-law (14) that "every person who shall intend to construct any water-closet . . . or to fix or fit in connexion with any water-closet any apparatus or any trap or soil pipe shall before executing any soil works give notice in writing to the clerk of the sanitary authority." The railway company had occasion to renew the pans and traps of certain closets constructed before the Act. The Court held that the by-law applied to the fitting of apparatus to existing closets as well as to those subsequently constructed.

THE REPAIR AND IMPROVEMENT OF DUNBAR HARBOUR.—The Town Council of Dunbar have resolved to employ Mr. W. T. Douglass, C.E., London, to prepare a report upon the best means of restoring that portion of the new harbour which has just fared so badly.

SEWAGE DISPOSAL, TEDDINGTON.—At the meeting of Teddington District Council recently Mr. M. Hainsworth, surveyor, presented a scheme for extensions and alterations at the sewage disposal works. The scheme, which is estimated to cost 27,161*l*., was agreed to.

REFUSE DESTRUCTOR, LIFFORD.—The refuse destructor which has been built for the King's Norton District Council at Lifford was officially opened on the 13th inst., although it has been in working order since October. The destructor has been built under the direction of Mr. Cross by Messrs. Heenan & Froude, of Manchester and Worcester. The building and machinery cost about 14,000*l*. The destructor is so arranged that the only outlet for the fumes and smoke is the tall chimney. The heat produced by the combustion of the dust and ashes is utilised for making steam, and it is expected that from this source there will be an income of 1,500*l*. or 2,000*l*. The clinker taken from the furnaces after combustion will be used for making roads and paving of the asphalt type.

PROPOSED SEWAGE DISPOSAL WORKS, ILKESTON.—On the 13th inst. Colonel A. G. Durnford, R.E., Local Government Board Inspector, held an inquiry at Ilkeston respecting a proposal to borrow 27,000*l*. for the purposes of sewage disposal. The Town Clerk said the question of adopting a new scheme of sewage disposal was one of urgency, as complaints had been made by the Derby and Notts County Councils as to the polluted condition of the Erewash, and an order of Court had been served to discharge a purified effluent into the river. Ilkeston was expected to have the new works completed by 1910. Mr. Raikes (of Messrs. Wilcox & Raikes, engineers, of Birmingham) submitted particulars of the plans and methods proposed to be adopted.

IMPROVEMENTS, WARKWORTH HARBOUR.—The Warkworth Harbour Commissioners have had under consideration for some time a scheme of improvements for the harbour, and the result of their deliberations is that a scheme is about to be carried out, which has been drawn up by Mr. Sanderson, the harbour engineer. It is first of all intended to extend the south jetty to the south pier head, and to extend the south pier out a distance of 240 ft. seaward, parallel to the north pier, by which means it will be possible to obtain two extra feet of water on the bar, and thus facilitate the egress and ingress of vessels at the harbour. In addition to this a system of groins is to be established at the north sands in order to combat the inroad the sea has been making during the past year.

Foreign.

FRANCE.—A subscription is to be opened to raise a monument to Gambetta on the Place Gambetta, Paris.——A committee has been formed to raise a monument at Nogent-sur-Seine to the memory of the sculptor Paul Dubois. It is to be carried out by his pupil M. Alfred Boucher.——A committee has been formed with the object of ensuring the preservation of the sites and buildings of the pretty village of Gargilesse, and to oppose any alteration of its ancient picturesque quality.——The Municipality of Boulogne-sur-Seine are about to undertake the building of a Salle des Fêtes and a Cirque at Boulogne-sur-Mer.——The Municipality of Agen have opened a competition for rebuilding the theatre of that town.——The "Société pour le protection du Paysages de France" has communicated to the Municipality of Annecy a resolution to the effect that, in case of the building of a Casino there, no portion of the lake nor of the alley of trees called the Albigny should be interfered with. The Society has also passed a resolution to the effect that the route for the railway line from Paris to Chartres should be so laid out as to avoid injuring the district of Vaux de Cernay.——The works for the improvement of the port of Calais are shortly to be commenced, the total cost is estimated at nearly 4,000,000 francs.——For the first time this year, the New Salon is to have a section of music with a special

jury to decide on the awards. Eighty-six compositio ns have been accepted for performance between April 15 and June 30. The performances, to take place twice a week, will be directed by M. Paul Viardot.——The General Council of the department of Lot-et-Garonne has voted for the rebuilding of the Hôtel de Préfecture at Agen, recently destroyed by fire, at an estimated cost of 870,000 francs.——Important works, at a cost of 2,100,000 francs, are to be undertaken for the improvement of the port of Bayonne, and for the cutting of two channels in the rocky bank of the Casquets.——A competition has been instituted, open to all French architects, for the erection of a new Hôtel de Ville at Fismes.——The Municipal Theatre of Saint-Germain-en-Laye is to be rebuilt on its present site. 300,000 francs are to be spent on the building, the design for which will be the subject of a public competition.——A competition has been opened for the erection of an Art-School at Nancy.——The Naval Museum Collection, hitherto at the Louvre, is to be transferred to the Invalides, where it will become an annexe to the Military Museum.——A competition has been opened for the construction of a ferro-concrete bridge, 51 mètres in span, over the torrent of the Voinçon, at Volonne, in the Lower Alps.——M. Cordier, Departmental Architect, has drawn out a scheme for the rebuilding of the Palais de Justice at Belfort.——M. Formigé has prepared a scheme, to be submitted to the Commission des Monuments Historiques, for carrying out a restoration of the Roman theatre at Orange in such a manner as not to injure its archæological value. He proposes only to build up rifts in the walls, to restore the *gradins* (the rows of seats), and the staircases which give access to them, and to repave the passages. He considers that this will fit it for the revival of classic drama, without any further restoration in detail.——A committee has been formed for the erection in Paris of a monument to Fragonard, of which M. Auguste Millard will be the sculptor.——The jury in the competition opened for the construction of a group of school buildings at Franconville (Seine-et-Oise), has awarded the first premium to M. Bassompierre-Sewrin.——The death is announced, at the age of eighty, of M. Louis Leullier, formerly architect to the city of Amiens. Among other important works he completed the Hôtel de Ville of Amiens, and carried out a scheme for the water supply of the place. He was a member of the Société Centrale des Architectes.——The death is announced of M. Borrel, "architecte-correspondant" of the Department of Public Instruction, who took a considerable part in the architectural improvements of the towns of Brides, Salins, and Montiers, at which latter place he died.——The death is also announced at the age of 74, of M. Léon Painlevé, an architect who is credited with various discoveries in connexion with industrial chemistry; and also, at the age of 65, that of M. Edmond G. Andrieu, "architecte-expert" in legal matters.

SOUTH AFRICA.—At a recent meeting of the East London Municipal Council it was resolved that the Town Engineer, in conjunction with other officials, be instructed to prepare a plan of the site on the market square selected for the proposed market buildings, and all other particulars and conditions necessary for the purpose of enabling competitive plans to be called for the erection of the buildings in question, at a cost of about 20,000*l*.——During the period December 16 1905, to January 13, 1906, forty-one building plans were under consideration by the Cape Town municipal authorities; of these twenty-three were approved, ten returned to the architects, and the remainder are under consideration. The approximate cost of the proposed work is 12,390*l*. ——The Building Committee of the St. George's Cathedral, Cape Town, have invited tenders for the erection of the superstructure of the eastern portion of the cathedral.——Mr. John Lyon has been awarded the premium for his design for new offices, to be erected in St. George's-street, Cape Town.——At Woodstock, near Cape Town, unusually rapid progress is being made with the storm water drainage scheme, which is being executed departmentally at an estimated cost of 70,000*l*.——Speaking at the inauguration of a new congregational church at Booysens, Johannesburg, Lord Selborne said he regretted that the architects of South Africa so faithfully copied European models. He thought a country ought to have its distinctive architecture in the new world as well as in the old. He wished South Africa might have an architecture all its own.——The Grand Theatre, Bloemfontein, was recently inaugurated. It has been built from the designs of Mr. E. C. Choinier, architect, of Johannesburg. The contract for building was publicly tendered for, and tenders ranging from 30,000*l*. to 42,000*l*. were received, Messrs. Corlett & Jeddes, of Johannesburg, being the successful tenderers. The galleries are constructed on the cantilever principle. The theatre was built in fourteen months.——The foundation-stone of a new Government school in Johannesburg was recently laid by the Countess of Selborne. When completed it will provide accommodation for 312 scholars. The foundation is of stone with brick plastered walls above. The school is built on a design prepared by the Public Works Department, and the work is being supervised by Mr. Gordon Russell, the local inspector of works.——Market buildings and town offices are to be erected at Klerksdorp, at a cost of 3,400*l*.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. R. E. W. Berrington & Son, civil engineers, Wolverhampton, have taken into partnership Mr. A. G. Martin, and the practice will be carried on in future under the style of "Berrington, Son, & Martin."——Mr. George Bell, contractor, Tottenham, has converted his business into a company, and it will be carried on in future by and in the name of "George Bell & Sons, Ltd." Mr. Bell will continue to control the business, and his sons will be associated with him in its management.——Mr. Louis P. Casella (now Casella & Co.), scientific instrument makers and mechanical engineers, have removed from 147, Holborn Bars to 11-15, Rochester-row, Victoria-street, S.W.——The British Prometheus Company, Ltd., electrical heating specialists, Kingston-on-Thames, are removing their works and head offices to Birmingham, and on and after the 21st inst. all communications must be addressed to them at Salop-street Works, Highgate, Birmingham. Their Birmingham telephone number will be 4236 Central, and their telegraphic address "Cooking, Birmingham." The firm will retain their London showrooms at 27, Ely-place.

STATUE OF THE QUEEN.—Mr. George Wade is commissioned to execute a statue of the Queen, which the governors and staff of the London Hospital desire to erect in the central garden, in celebration of the recent extension of the buildings and of Her Majesty's acceptance of office as President of the Hospital. The garden will be laid out and tended by the East London Horticultural Society.

BATHER MEMORIAL, MEOLE BRACE. — A memorial to the late Rev. Henry Francis Bather is to be erected at Meole Brace. It will take the form of a cross, fashioned upon the lines of some of the old existing preaching crosses. The whole will be of red magnesium limestone, excepting the die stone, which will be of red granite. Above, will rise an octagonal monolith shaft, moulded at its base, and surmounted by a carved capital of conventional foliage of XVth century type. Surmounting all will stand a cross, having foliated terminations, and a shield bearing upon its face the sacred emblem "I. H. S." The work is being carried out under the direction of Mr. H. H. Treasure, of Shrewsbury, Diocesan Surveyor of Lichfield, by Messrs. Harry Hems & Sons, of Exeter.

DANISH MONUMENTS IN YORKSHIRE.—Dr. G. A. Auden lectured on the 12th inst. before the Yorkshire Philosophical Society at the Museum Theatre, York, on "The Remains of Danish Sculpture in Yorkshire and Derbyshire." He said this was a much-neglected branch of art of considerable historical value. York and Durham possessed the best collections of pre-Norman crosses, dating chiefly from the VIIth and Xth centuries. In York there was a strong Danish element, the city having been the centre of the kingdom of Northumbria, Eric, the last Danish King of York, being Eric Bloody Axe of Scandinavia. Incidentally, the lecturer remarked that the Yorkshire Danish monuments were largely aggregated in a radius of twenty miles round Leeds, Ilkley, Collingham, Thornhill, and Dewsbury. A notable example of the Danish cross was that found at Leeds Parish Church, representing the legend of Weland and the Swan Maidens. He observed that the term Runic cross was as a rule, a misnomer, because a cross was not Runic unless it bore a Runic inscription. Dividing pre-Norman crosses into two classes, Anglian and Viking, the lecturer said the characteristic of the former (date 700-900) was that they were strongly influenced by the Lindisfarne school, by truly Celtic art, with vine scrolls as a predominant decorative motive. The Viking (900-1050) monuments were distinguished by zoomorphic designs. The interlaced work was less regular, and displayed a want of finish, the key pattern and spiral of purely Celtic work being absent. The lecture was illustrated by several views of Danish sculpture, some notable examples being found in York and in Derbyshire.

LONDON BOROUGH COUNCILS AND WAGES.—At a conference of representatives of the London Borough Councils who met at Lambeth Town Hall last week, a resolution was passed by a large majority in favour of a minimum wage of 30*s*. a week for all employees of the borough councils. On the question of a forty-eight hours' week being put to the vote, it was lost.

MEMORIAL TO J. M. WHISTLER.—Nearly half of the estimated cost, 2,000*l*., is subscribed for the international memorial which it is proposed to erect in Cheyne-walk, Chelsea. M. Auguste Rodin is engaged upon the work, and a contribution of 500*l*. will be made by the International Society of Sculptors, Painters, and Gravers.

ARTISANS', LABOURERS', AND GENERAL DWELLINGS COMPANY, LTD.—The Board have decided to discontinue for a while building operations on the Leigham-court estate of 66 acres at Streatham-hill, as they consider that the whole of South London is greatly over-built, and a large number of houses are unoccupied. The company possess 3,000,000*l*., invested, for the greater part, in freehold property, having a resident population of more than 40,000 persons. During the past year the shareholders provided an additional sum of 100,000*l*., which has been devoted chiefly to the completion of building works at Noel Park.

OPEN SPACES.—The threatened disfigurement of Hindhead by telegraph posts is averted. The Postmaster-General, in response to an appeal made by the National Trust, has agreed to carry the proposed new trunk telephone line to Portsmouth along the railway between Witley and Haslehurst and so avoid Hindhead. In co-operation with the amended scheme the London and South-Western Railway Company have consented to waive their rights of maintenance. The Hindhead property, which belonged to the late Mr. Whitaker Wright's estate and includes the Devil's Punch Bowl, Witley, and Gibbet Hill, has been purchased by a local committee with the object of preserving it as a public open space; the common land extends over some 750 acres.——The Crown have bought from Lord Iveagh the Long Meadow, on the bank of the river Liffey, as an addition to Phœnix Park, Dublin.——Gifts have been recently made of 10 acres of Valentine's Park, Ilford, by Mr. Holcombe Ingleby to the Ilford Urban District Council; of his shares in the Leigh Woods Land Company by the late Mr. A. C. Pass, of Clifton Down, to the Merchant Venturers, of Bristol, with the expressed desire that they should use the influence thereby acquired to preserve the lands adjoining the river Avon (held by the Company) in their present condition and maintain the plantations thereon; of about 1¼ acres, as altered for a playground, by Mr. W. Cadbury to Stirchley Urban District Council; of a parcel of land by the late Mr. W. W. Warner, of Stanley House, St. Ives, to the St. Ives, Hunts, District Council; and by the Lightwoods Estate and Warley Woods Committee of 26 acres as a public park and playing fields to the Birmingham City Council, together with an offer of nearly 14,700*l*. already subscribed towards the acquisition of 94 acres in addition, in respect whereof the total purchase-money amounts to about 43,000*l*.——Sir George Meyrick has accorded his consent to the construction by the Bournemouth Corporation of a drive along the under-cliff from the pier to Meyrick-road.——It is announced that Mr. Andrew Carnegie purposes to present to the University Court of St. Andrews University securities yielding 500*l*. per annum, for the up-keep of the recreation park, with gymnasium and hall, which at an outlay of 15,000*l*. he recently gave to St. Andrews University.——The vendors of the finely-timbered estate, Whitton Park, near Hounslow, have agreed to suggestions made by the Metropolitan Public Gardens Association to reduce the price at which they will sell the property, 45 acres, conditionally upon its being converted into a public park, and the Twickenham Urban District Council have offered 3,500*l*. towards the required sum of 15,000*l*.——The Association have taken steps to save, if possible, the estate known as Boleyn Castle, Upton Park, which comprises a fine old garden. ——A faculty has been granted to the Poplar Borough Council for the laying out of All Saints' churchyard as a recreation ground; and the Southwark Borough Council have agreed to rent for 80*l*. per annum to the London County Council a space of 6,000 sq. ft. in King James-street as a children's playground.——The Royal Horticultural Society are now entrusted with the charge of examining candidates for appointment as head-gardeners in the London County Council parks and grounds.

BUILDERS' EXCHANGE, BIRMINGHAM.—An address on "Canadian Cities" was delivered on the 15th inst. to the members of the Birmingham Builders' Exchange by Mr. Peter Ball, the resident agent in Birmingham for the Commercial Agency of the Government of Canada. The members assembled in the Exchange Hall under the presidency of Lieutenant-Colonel Barnsley. Mr Peter Ball, in the course of his address, traced the history of Canada from the time of the capture of Quebec from the French by General Wolfe in 1759, and subsequently he spoke of the Canadian cities and municipalities, and specially referring to Toronto, the second city in the country, as typical of the whole. He gave the area of the city, the population, the number of streets, and described the tramway system. The city owned the streets and the authorities conceded the tramway rights to a company for twenty-one years, when they could be purchased by the municipality. The company paid the city 160*l*. per annum per mile for the right to run the trams, and in addition a percentage of the gross receipts. Up to 200,000*l*. the company paid 8 per cent., from 200,000*l*. to 300,000*l*. 10 per cent., from 300,000*l*. to 400,000*l*. 12 per cent., from 400,000*l*. to 600,000*l*. 15 per cent., and from 600,000*l*. upwards 20 per cent.

In 1895, when that arrangement was entered into, the city drew in percentage and mileage upwards of 27,000*l.*, and in 1904 more than 64,000*l.*; while in the nine years the amount received was 360,000*l.* The cost of living, the cost of schools, and other things was much less than in this country, the rents of houses were pretty much the same, the water rates were lower, and the gas charges were a little higher; but the light and heating qualities were very much better. At the close Mr. Ball was warmly thanked for his address on the motion of Lieutenant-General Phelps, seconded by Mr. Wm. Sapcote.

THE DISFIGUREMENT OF SCENERY.—In the House of Commons on the 14th inst. Mr. Kennedy asked the First Lord of the Treasury whether he would consider the advisability of giving the Board of Trade or local public bodies the control of trade advertising and issuing licences for the same; and, in view of the fact that many beauty spots are disfigured at present, and that revenue was lost to the State, would he introduce legislation on the above lines.—Sir H. Campbell-Bannerman: The questions raised by the hon. gentleman require a little more attention than I have been in a position to give them. I sympathise with his desire to prevent the disfigurement of beautiful scenery, but whether this can be accomplished by the methods suggested by the hon. gentleman I am not so sure.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 15th inst. at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., The Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz:—Building new churches at Barry, All Saints, Glam., 175*l.*; Summertown, near Oxford, 200*l.* for the first portion, and Well Hall, S. Luke, Eltham, Kent, 200*l.* for the first portion; towards rebuilding the church of All Saints, Woodburn, Northumberland, 75*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Bourton, S. James, Berks., 20*l.*; Lower Guiting, S. Michael, near Cheltenham, 15*l.*, making in all 50*l.*; Southchurch, Holy Trinity, near Southend-on-Sea, 80*l.*, and Stonebridge, S. Michael and All Angels, Middlesex, 70*l.*, in lieu of a former grant of 50*l.* A grant was also made from the special Mission Buildings Fund towards building the Mission Church of S. Mary, South Bermondsey, Surrey, 50*l.* The following grants were also paid for works completed:—Polebrooke, All Saints, near Oundle, 30*l.*; Great Ellingham, S. James, Norfolk, 25*l.*; Felling-on-Tyne, Christ Church, 40*l.*; Hucknall Huthwaite, All Saints, near Mansfield, 40*l.*; Stanton Harcourt, S. Michael, near Oxford, 65*l.*; Ben Rhydding, S. John, near Ilkley, 200*l.* on account of a grant of 225*l.*; Beeston Hill, The Holy Spirit, Leeds, 230*l.*; Tudhoe Grange, The Venerable Bede, Co. Durham, 30*l.*; and Swansea, S. Jude, 50*l.* In addition to this the sum of 296*l.* was paid towards the repairs of seventeen churches from Trust Funds held by the Society. The Society likewise accepted the trust of a sum of money as a Repair Fund for the Church of S. Clement, City-road, E. The Annual General Court of the Society will be held at the Church House, Dean's-yard, Westminster, on Thursday, May 17, at 3 p.m., when the chair will be taken by His Grace, The Lord Archbishop of Canterbury, President of the Society.

LABOUR RETURNS.—The Labour Returns, though still showing an improvement in most trades, prove that the building trade is still affected by the depression from which it has so long suffered. The Memorandum of the Labour Department of the Board of Trade for February states that only a "seasonal" improvement had taken place and the rate of employment remained the same as in February last year. With this continued depression it is hardly surprising to learn, from an article in the Board of Trade Labour Gazette, that the Distress Committees under the Unemployed Workmen Act report that the classes of workpeople most generally affected by distress are those connected with the building trades and general labourers. It is sad to see the high proportion of skilled artisans who are affected by the distress.

DISFIGUREMENT OF A STREET.—In the Parliamentary Papers last week Mr. Wiles, M.P., asks the Postmaster-General if he is aware that telephone posts are now being placed in St. Peters-street, St. Albans, thereby disfiguring one of the most beautiful streets in the Home Counties, and, if not, will he institute an inquiry as to an alternative route for these poles.—Mr. Sydney Buxton, in reply, states that he is giving attention to the matter, and if a practical alternative route can be devised, he will be very glad that the trunk line should avoid St. Peters-street. So far, however, the Corporation have been unable to obtain the necessary wayleaves for an alternative route.

ELECTRIC LIGHTING AND IMPROVEMENT SCHEME, STRATFORD.—On the 13th inst. Mr. H. Hooper, M.A., M.Inst.C.E. (Local Government Board Inspector), held an inquiry into applications by the Town Council for sanction to borrow 18,750*l.* for purposes of electric lighting and 9,258*l.* for works of private street improvements. The Borough Electrical Engineer (Mr. Ullman) gave figures as to the electricity scheme, which, he said, had been in existence since 1901. Mr. Campbell, the Borough Surveyor, gave evidence as to the proposed private street improvements. They included the making up of the following private streets: Pulleyne-avenue, Basil-avenue, St. Margaret's-avenue, Southchurch-road, Ladysmith-avenue, Landseer-avenue, Church-road, and Gooseley-lane.

MEMORIAL TO THE LATE DR. R. MILNE MURRAY.—A monument has just been erected in the Dean Cemetery over the grave of the late Dr. Robert Milne Murray. It is in the form of a Greek stele in grey granite, which rests on a rough-hewn base. The inscription is in raised bronze letters on the face of the shaft. The rough-hewn base bears an alto relievo portrait bust of Dr. Murray. The monument is from the studio of Mr. H. S. Gamley, sculptor.

STREET IMPROVEMENTS, DEVONPORT.—Mr. M. K. North, M.Inst.C.E., Local Government Board Inspector, held an inquiry at Devonport on the 13th inst. into the application of the Devonport Borough Council for sanction to borrow 2,251*l.* for works of private street improvements, and 5,051*l.* for the laying out of certain parks or recreation grounds. Mr. J. F. Burns, Borough Surveyor, explained that the amount of 2,251*l.* for works of private street improvements included the following streets and lanes:—Lane between Edith-street and Victoria-road, estimated cost, 192*l.* 0s. 1d.; lane between Whittington and Amherst streets, 503*l.* 6s. 1d.; lane between Alma-road and Amherst-street, 790*l.* 16s. 10d.; St. Aubyn-avenue (section 1), 385*l.* 15s. 11d.; Coldrenick-street, 379*l.* 3s. With reference to the proposed recreation grounds the Town Clerk stated that the loan asked for was made up of 3,982*l.* for Keyham Barton recreation ground, 569*l.* for North Down, and 500*l.* for Rocky-hill. The Surveyor explained that the area of the Keyham Barton Park was about 3¼ acres. It was proposed to enclose the site and also to construct a promenade path 25 ft. wide on the top of the site, and to form narrower paths leading to the various entrances. The North Down site at Ford was set apart as a recreation ground for children, and was about 4½ acres in extent, and the area of the Rocky-hill site was just over one acre.

ROMAN VILLA, WEST MEON.—Mr. A. Moray Williams, of Bedales School, near Petersfield, has given the following particulars of the newly-discovered Roman villa at West Meon. The villa stands in Little Lippen-wood on the slope of a hill, about half a mile from West Meon Church. The chief features that have been determined at present are a block of six rooms, what is thought to have been a gateway on the east side, a double hypocaust in the south-west corner, and a buttress backing the wall to the block of rooms. One of the rooms, measuring 10 ft. by 33 ft., was paved plainly with red brick tesseræ, and was perhaps too broad to form a passage. As a sleeper wall underlies the tesseræ at 10 ft. from its west end, it may have been divided by folding doors or other partition. The base of a moulded column in its original position, with a coat of red paint still adhering to it, is completely visible, and traces of a similar column opposite indicate a doorway leading to Room 2. This room, which measured 21 ft. by 10 ft., was also paved with red tesseræ, but with a border of white ones, and there also are sleeper walls indicating partitions or folding doors. Room No. 3 measured 21½ ft. by 11 ft., and was paved with mosaic of a somewhat elaborate geometrical pattern of red, black, white, and blue. In the centre there was an octagon panel, which may have contained a figure, but it has been wholly destroyed. To the right of Room 2 was a room measuring 11 ft. by 10 ft., also covered with a mosaic pavement. This pavement is well preserved, and is very beautiful, if only from the fact of its simplicity. It is only geometrical in red, white, and black. The pavement has sunk considerably, and perhaps lies over a hypocaust. The other two rooms have not been yet fully excavated. At the south-west corner the hypocaust presented most unusual features. It was 21 ft. in length, and consisted of two chambers, each fitted with an apsidal termination. It cannot yet be said with certainty to which type this house belonged. It may turn out to be a small courtyard house, but it is quite possible that a corridor may be found. Near the spot was found an abundance of iron slag, which indicates the former existence of a smithy. Further excavations will be undertaken this summer on the spot, and the two mosaic pavements already found will probably be permanently preserved.

SHEFFIELD WORKMEN'S DWELLINGS.—Colonel Durnford recently held a Local Government Board inquiry into an application by the Sheffield Corporation for the approval of a scheme for providing new dwellings for persons of the labouring class. Mr. W. E. Hart, who appeared for the Corporation, explained that by a Provisional Order (1902) they were authorised to purchase or acquire a number of houses occupied by persons of the labouring class in or near West-street, Shalesmoor, and Moorfields, and required in connexion with the proposed widening of those thoroughfares. This application was to provide as many new dwellings as should be deemed desirable in accordance with Local Government Board requirements, in view of the number acquired. The Council had felt for some time that there was no need for the provision of additional housing accommodation for the working classes in the central parts of the city beyond what was already provided, and inasmuch as there was power to accept a scheme for providing housing accommodation for a smaller number of persons than those actually displaced, the Council asked the Local Government Board to accept a scheme which provided re-housing accommodation for thirty-nine persons in lieu of the 170 persons who would be displaced. On a part of the Crofts area the Corporation had erected, with the approval of the Local Government Board, a block of tenements consisting of single-room tenements. They had to provide certain additional buildings with accommodation to the number of persons whom they were under an obligation to provide for, and it was estimated that these additional buildings would give accommodation to 175, or thirty-nine more than were required. It was this excess number of thirty-nine which the Corporation asked the Board to accept as an adequate re-housing accommodation for the persons dispossessed under the 1902 Order. In proof of the statement that there was no need at the present time for the provision of further housing accommodation for persons of the working class in the central parts of the city, Mr. Hart offered the following information:—Number of inhabited houses, 92,225; number of uninhabited houses of the rental of 10*l.* and under, 1,595; of the rental 10*l.* 5s. and under, 1,269; of the rental of 20*l.* and over, 649; total uninhabited houses, 3,513. Evidence was given by Mr. C. F. Wike (City Surveyor).

EDINBURGH BURGH ENGINEER'S REPORT.—The report of Mr. James Massie, Burgh Engineer and Master of Works to the Corporation of Edinburgh, for the year ending December 31, 1905, has been issued. Mr. Massie deals in detail with the work overtaken during the year in connexion with sewers and drains and building operations. The total expenditure on "unemployed" on the works carried on amounted to 2,792*l.* for labour and material. The works on which they were engaged were principally drainage. It is mentioned that the lowering of the rate of pay from 2s. 6d. to 2s. a day did not appreciably affect the numbers who availed themselves of the work offered by the Corporation. The only work in connexion with the housing of the working classes that was in progress during the year was the reconstruction of the old properties at Greenside. That had proceeded more slowly than was anticipated on account of carrying out the work in small sections so as to cause as little hardship and inconvenience as possible to the tenants. Up to the date of the report, six blocks had been reconstructed; two were in the course of alteration and were approaching completion, while schedules for the reconstruction of other two blocks were being prepared.

Capital and Labour.

STATE OF THE BUILDING TRADES.—Employment in the building trades remained dull in February, but there was a slight improvement on the whole as compared with a month ago. It showed little change compared with a year ago. Returns received through the trade correspondent from 61 London employers showed that in the last week of February they paid wages to 10,445 workpeople of all classes, compared with 10,339 in January, and 12,086 in February, 1905. Employment generally in London was much the same as in the previous month, but worse than a year ago. Returns were received from Employers' Associations in 71 districts outside London, and in nearly all of these employment was reported as dull generally. Compared with a month ago, no change was reported in 55 towns, while in 8, including Birkenhead, Lancaster, Blackpool and Dublin, employment was better, and in 8, including Stockport, Chester, Rugby, Newport and Aberdeen, it was worse. Compared with a year ago, employment was reported about the same in 42 towns, worse in 22 and better in 7.—*Labour Gazette.*

Legal.

MUNIFICENT BEQUEST FOR THE ERECTION OF MODEL DWELLINGS.

THE case of in *re* Sutton deceased—Sutton *v.* the Attorney-General, came before Mr. Justice Warrington in the Chancery Division last week for further consideration.

The facts of the case were shortly these:—The late Mr. Wm. Richard Sutton, who died in May, 1900, by his will gave his residuary estate, valued at about 1,745,000*l.*, to the plaintiffs as his trustees upon trust to purchase or acquire from time to time freehold or copyhold land in London or other populous centres in England as sites for the erection of model dwellings and houses, and to build upon the sites model dwellings and houses to be called the Sutton Model Dwellings, for use and occupation by the poor, and to let the dwellings and houses to the poor at such rents (being below the full rents obtainable) as his trustees in their discretion should determine, the rents to be held for the purposes of the trust. The testator expressed a wish that some rent, however small, should in each case be reserved and paid and that no person should be allowed to live in the dwellings rent free. The present action was commenced in March, 1901, by the trustees, asking for administration of the trusts of the will, and an order was made directing the usual accounts and inquiries. The Master's Certificate found that there was standing in Court to the credit of the action about 750,000*l.*, there being about 1,000,000*l.* still outstanding. The trustees wishing to commence the active administration of the charity by acquiring sites and proceeding with the erection of model dwellings as soon as possible, minutes of an order were settled on their behalf asking that a scheme for the regulation and management of the charity should be settled by the judge. The Treasury Solicitor, however, suggested that the matter should be referred to Chambers and the reference be stayed for two years, so that time should be given to consult the Local Government Board and other persons whose opinion might be valuable as to the mode in which such a charity could be administered. The trustees contended that a delay of two years would be unreasonable, and asked that the reference to settle a scheme should be immediate. They also asked for power to apply 250,000*l.* out of the sum in Court for the acquisition of sites and the erection of dwellings in one or two centres immediately.

At the conclusion of the arguments of counsel, his lordship declined to stay proceedings and referred the matter to Chambers for the scheme to be settled in the usual way. He also gave the trustees liberty to apply for leave to make a start before the general scheme was finally settled.

Sir Robert Finlay, K.C., and Mr. Ashton Cross appeared for the plaintiffs; and the Attorney-General and Mr. R. J. Parker for the defendant.

ACTION BY BUILDER ON ARCHITECT'S CERTIFICATE.

THE case of Capel *v.* Ayton came before the Court of Appeal, consisting of Lords Justices Vaughan Williams, Stirling, and Fletcher Moulton on the 19th inst., on the plaintiff's appeal from an order made by Mr. Justice Sutton in Chambers.

Mr. Turrell, in opening the case, said the plaintiff appealed from an order of the learned judge confirming the order of the learned official referee. The point in the case was whether the learned official referee and the learned judge were right in striking out from the statement of claim that part of the claim which asked for a declaration. The action was brought by a builder under a building contract for moneys which had been certified by the architect, and the position taken up by the defendant was that he was not bound by the certificate which had been given by the architect. The learned counsel said that in drawing the statement of claim he found a clause in the contract that 5 per cent. of the amount certified for should be retained in order to see if there were any defects in the work appearing within three months. It was the ordinary retention clause.

Lord Justice Moulton said he understood the learned counsel wanted to add a declaration that the retention moneys had become due.

Mr. Turrell: Yes.

Lord Justice Moulton: How does the declaration help you—by putting to your credit the sum found due to you?

Mr. Turrell replied that the retention moneys were not due at the date of the commencement of the action.

Lord Justice Moulton: The other side do not refuse to allow the official referee to give you credit for what is due in fact?

Mr. Turrell: Oh, yes, they take up any defence they are entitled to take up! The only way I can get these moneys is by asking for a declaration that the moneys have become due.

Lord Justice Vaughan Williams: It is the only way you can get the moneys under this writ. If you wait until the time of retention comes to an end you can issue a fresh writ. The only point here is that you have found, now you have looked into it, that, having regard to the retention clause, you issued your writ rather too soon. You do not want to drop your writ, but you wish to keep it by asking for a declaration that these moneys you are entitled to, after they have served the purpose of being a security for the fund.

Mr. Russell Spokes, in answer to Lord Justice Moulton, said the retention money was kept for three months in order to see whether any defects in the work appeared within that time. It was in the circumstances impossible to say that at the date of the writ the plaintiff had a right to the declaration. He submitted that the plaintiff had no right to put the defendant to the expense of the appeals.

Lord Justice Vaughan Williams asked Mr. Spokes if he disputed the validity of the certificate.

Mr. Spokes replied that he did because there was nothing in the contract which made the certificate final. He did not object to the official referee bringing the retention money into the account.

Lord Justice Vaughan Williams, in giving judgment, said he thought they ought to allow the plaintiff to amend, Mr. Spokes being willing that the sum in question should be brought into account, even though it was not due at the time the writ was issued. The costs of the appeal would be left to the official referee to deal with.

The other lord justices concurred.

BURSTING OF A WATER MAIN IN PICCADILLY-CIRCUS.

THE hearing of the case of the London Hydraulic Power Company *v.* the St. James's and Pall Mall Electric Light Company concluded before Mr. Justice Farwell in the Chancery Division on the 19th inst.

The question in the case was as to who was responsible for the mischief caused in the West-end by the bursting of a water-main in Piccadilly-circus on July 10 last. Plaintiffs are the owners of the main, and defendants were alleged to have caused the accident by constructing an inspection-chamber or manhole, so that it rested on the pipe and transmitted to it the vibration caused by traffic above.

Sir Edward Clarke, K.C., in opening the case said that although the amount actually claimed by plaintiffs was under 200*l.*, a declaration was asked for which would affect other liabilities of a very considerable sum. The plaintiffs had about 150 miles of hydraulic mains in London, and supplied about 6,000 customers with power for lifts and other purposes. In 1888 they had a main through Piccadilly-circus, and in 1889 defendants, without informing plaintiffs, constructed a manhole, or inspection-chamber, over the main in such a way that two of the walls, 2 ft. 6 in. in diameter, rested on the pipe. It was a strong 6-in. pipe, the metal being 1¼ in. thick. The pressure at which the water entered the main was 75 lbs. per sq. in., whereas it had been tested to bear a strain of 2,250 lb. The accident happened at about 8.15 p.m. on July 10, and it was not until midnight that the escape could be located, by which time the wood paving almost as far as Pall Mall had been ripped up, and other serious mischief done. Plaintiffs would prove that the breakage of the pipe was not caused by pressure of water. Defendants counterclaimed in respect of damage done to them in the matter on the ground that there was something faulty in the construction of the pipe. Defendants also alleged that a great deal of damage was due to delay in remedying the mischief after it was discovered, but he would prove that everything possible was done at the earliest moment. The damages claimed, apart from the declaration, were in respect of relaying the main, and the cost of 300,000 gallons of water that escaped.

A number of witnesses gave evidence to the effect that there was no defect in the pipe, that the bursting was not caused by excessive water pressure, and that immediately the pipe burst prompt measures were taken to stop the outflow of water and prevent further damage. Various witnesses gave it as their opinion that the two walls of the inspection-chamber, which rested on the defendant's main, transmitted the vibration of the traffic overhead and led to the fracture of the pipe.

For the defendants expert evidence was given with a view to proving that there had been a subsidence in the neighbourhood which was quite sufficient to have caused the breakage of the plaintiffs' main. Several of the defendants' witnesses also stated that, having regard to the point at which the break occurred, it could not have been occasioned by vibration arising from the passing of traffic over the inspection-box.

In the result his lordship held that the plaintiffs had failed to prove that the bursting of the main was due to any act of the defendants, and dismissed the action with costs. On the defendants' counterclaim he entered judgment for them for 35*l.* odd with costs.

Order accordingly.

THE COMPOSITION OF MORTAR.

AT the Greenwich Police Court, before Mr. Baggallay, on Wednesday in last week, Messrs. H. & G. Taylor, builders, of 51, Boyne-road, Lewisham, appeared to summonses, issued at the instance of the London County Council, alleging an infringement of the by-laws under the Building Act in regard to the composition of mortar used by them in the construction of certain houses in Boyne-road and Belmont-road, Lewisham. Mr. Bodkin appeared for the Council, and the defendants were represented by Mr. Macmorran, K.C., with whom was Mr. Cunningham Glen. The point in which it was alleged that the mortar did not come up to the by-laws was that it did not contain lime in the proportion of one part to three of clean sand or grit, and evidence was given by Mr. J. H. Coste, an assistant in the chemists' department of the London County Council, who had analysed a sample, to the effect that the proportion was much lower than this. He and other witnesses, who described the mortar as of poor quality, were cross-examined by Mr. Macmorran, with the view of eliciting that if the mortar had been made with the sand on the site, and measured with slaked lime, the proportion of slaked lime would have been one to three. Mr. Macmorran contended that there was nothing in the by-law to show that the proportion of dry lime to sand should be one part to three, and that it was the custom to measure the proportion of slaked lime. He contended further that the by-law was bad in point of law, on the ground of uncertainty, as it did not say whether the proportions must be of volume or weight, nor whether the lime, for the purpose of measurement, should be slaked or unslaked, while there was a difference of opinion upon the point. He quoted the Lord Chief Justice as deciding that the by-laws of a local authority must be free from ambiguity.

Mr. E. A. Gruning, F.R.I.B.A., a member of the Tribunal of Appeal, said he had inspected the houses, and found the mortar suitable. Some of the mortar was mixed in his presence, in the proportions of fourteen spadefuls of sand, thirteen of clinker, and nine of slaked lime. Mr. Max Clarke, F.R.I.B.A., said it was a common practice to take slaked lime in measuring the proportions for mortar, and Mr. F. W. Pott, general foreman in the employ of Messrs. Nightingale, and Mr. J. W. Reed, manager to Messrs. Holloway Bros., spoke to the taking of slaked lime for the purpose of measurement.

The magistrate said that there appeared to be no difficulty about the facts—the proportions of the materials used in making the mortar were three of other materials to one of slaked lime, and there was evidence of a practice of measuring it that way. Before more evidence was brought he would consider the legal question, and adjourned the further hearing *sine die*.

Patents of the Week.

APPLICATIONS PUBLISHED.*

3,619 of 1905.—DR. H. COLLOSEUS: *Manufacture of Cement from Furnace Slag.*

This relates to the method of the manufacture of cement from blast furnace slag wherein dissolved salts of calcium, aluminium, or magnesium are added to the liquid furnace slag, according to its composition, in such a manner that the cooled slag in a pulverised condition will harden to cement without further additions.

3,693 of 1905.—R. V. NOTLEY and W. T. P. TAYLOR: *Tops of Chimneys and Ventilating Stacks or Shafts.*

This relates to tops of chimneys and ventilating stacks or shafts, and consists of a dwarf self-flanching and weathering pot, constructed with a square or rectangular flanch so shaped that it slopes at top from the centre of the chimney shaft towards its sides, or from the centre of the chimney stack or from a line mid-way between two sides thereof towards one or more sides of said stack according to its position thereon.

5,608 of 1905.—J. SHIRES and J. M. WOOLLER: *Machines for Dovetailing or Trimming Floor Joists.*

This relates to machinery or apparatus for dovetailing and trimming floor joists, consisting of a reciprocating frame actuated by suitable means and carrying a saw frame in which are two saws fixed at angles corresponding with the dovetail required to be cut; the said saws are caused to move to and fro during the cutting operations by means of suitably-arranged gearing crank mechanism and connecting-rod, which gearing is operated by hand. In close proximity to the saws a tool or chisel is provided suitably mounted in a frame and adapted to effect the cut by actuating the same downwards and vertically by means of a weighted lever, which tool is employed for the purpose of cutting away the cut portions of the joist or portion between the angular or dovetail cuts, and thus forming a recessed cut or a complete dovetailed cut prepared for the insertion of or to receive a prepared or a correspondingly-formed part of another joist.

6,659 of 1905.—S. KEMP-WELCH: *Method of, and Apparatus for, Cleaning Walls and other Surfaces.*

According to this invention, high-pressure steam is employed as a means of cleansing hard surfaces

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

such as stone, brickwork, cement, wood, and the like. For this purpose a jet of high-pressure steam conveyed in a flexible or jointed pipe is applied, enabling the operator to direct the jet on any part of the surface to be cleansed. The high velocity of the steam, combined with the heat and moisture resulting from the condensation of the steam on the dirty surfaces, effectually and readily dislodges all dirt, leaving the surface in its original condition. In addition to the steam jet, a spray of detergent material may be applied, such as soap, soda, or the like, prior to, or simultaneously with, the application of the steam jet.

7,155 of 1905.—W. E. DAVIS: *Windows.*

This relates to windows, and consists in the arrangement of two strips of leather or other material of a pliable nature, fitted at each side of the window-sash. The two strips are placed back to back at a slight distance apart, the bottom or short flanges, in case of the strips being turned up, being on the outsides; these two parts are fastened to the frame of the door or window-sash, the fastening being made draught-tight. Small springs are fitted at each side to keep the long flanges together, the said strips being fitted to twice the depth of the window-frame. Then at each side of the window-frame is fitted, for the full depth of the window, a cast or stamped piece of material in the form of a letter T, having each of the short flanges either turned down or kept straight at the outer edges, in the case, when they are turned down, forming a groove at each side of the tongue. These tongues fit in between the two strips of leather, or other material of a pliable nature, fitted at each side of the window sash, the two top edges of the long flanges fitting into the grooves on the sash side of the T-pieces, if same are fitted, which are attached to the window-frame, thus allowing the window-frame to slide up and down as required.

7,938 of 1905.—E. SAVARY: *Panelled Woodwork.*

This invention relates to the construction of panelled woodwork, so that the various pieces may be fitted together and thus form a continuous piece or area of panelling without the necessity of hand labour thereon, except the labour necessary to fit together the pieces shaped as aforesaid, and so that this fitting may be done when the aforesaid panelling is being fixed to the surface it is intended to cover. The panelling is so designed and arranged that certain portions which form the styles and rails are grooved in such a manner that they may be secretly nailed and fixed to each other and to the area to be panelled, and at the same time the said grooves form an open mouth which facilitates the entrance into them of the panels. The styles and rails are also provided with tenons so formed that they exactly fit into the grooves which are also adapted to receive the panels.

8,323 of 1905.—SHARPE BROS. & CO., LTD., and N. E. COOKE: *Overflow Chamber of Lavatory Basins and Baths.*

This relates to a lavatory basin or a bath of the kind which is provided with an upright overflow chamber made integral therewith, and consists of a horizontal semi-circular or nearly semi-circular cover mounted on a central vertical pin at the front of the top of the overflow chamber, so as to turn about the pin and either close or open an overflow chamber, said cover fitting on a ledge at the top of the overflow chamber.

8,679 of 1905.—J. ARMOUR: *A Detachable Device for Locking or Fastening Window-Sashes and also for Enabling them to be Retained Slightly Open for Ventilation Purposes.*

This invention relates to a detachable device for locking or fastening window-sashes. The upper sash is made with a sash plate having a keyhole or other slot therein and at the back thereof a square or cross-shaped slot or recess is made in the sash. The parting bead has a check or recess of any suitable length made in it. The locking device consists of a lever or bar which has a cross head at one end and a spring key at the other end, said spring key being capable of being pressed into a slot of the sash-plate and of being turned round by means of a cap made with a bayonet slot in which it works a fixed pin on a casing surrounding the key spindle.

8,794 of 1905.—J. T. GIBSON. *Roofing Slates.*

This relates to an attachment for roofing slates used for repairs, said attachment comprising a plate or holder secured to the upper end of the slate and having at its other end a spring clip to engage with a clip on to the upper edge of the lath when the plate is slipped into position.

9,306 of 1905.—W. GRIFFITHS: *Show Stands or Brackets for Shop Window Dressing and the like purposes.*

This relates to show stands or brackets for shop window dressing or the like purposes, comprising an arm or bracket, a sliding or movable carrier upon the said arm or bracket, and adjustable rods disposed in a star-like manner and passing diametrically through the said carrier. The carrier is made in the form of a circular cupped disc having a flanged open end. To the said flanged end are attached a pair of clip-like parts for sustaining the disc upon the arm or bracket which is detachably mounted on a suitable stand or support in any ordinary manner. The disc can slide along the said arm or bracket for adjustment of its position as required.

9,967 of 1905.—V. PERRETT and L. PERRETT: *Apparatus for Sanding the Surface of Partly-Finished Bricks or other like articles.*

This relates to an apparatus for sanding the surface of partly-finished bricks or other like articles, comprising a box with open top, two separate compartments fixed upon the bottom of the box, their open ends extending up into the box, a fixed horizontal partition extending to the sides of the box and having openings fitted round the upper open end of the compartments, vertical plyers extending up through the bottom of the box into the compartments, a transverse lever pivoted to an arm below the box and having its ends jointed to the lower ends of the vertical plungers, platforms upon the upper ends of the plungers, and made to rise and fall alternately in the compartments by the oscillation of the lever, and a loose flexible diaphragm having its edge fixed inside the sides of the box resting and fixed upon the horizontal partition and having its loose part above the compartments and fixed to the edge of the platform at the upper end of the plungers, and means for causing the lever to oscillate upon its centre.

13,513 of 1905.—R. WHITEHEAD: *Sash Fastener.*

This invention relates to a method of jointing or locking the movable arm of a sash-fastener to the fixed plate without either pin, screw, or rivet. The arm has a short spindle attached to it which passes through the fixed plate and has a projecting part on its side at the bottom end, the fixed plate having a hole shaped to receive the spindle with the projecting part attached. When the spindle is inserted in the hole and the arm moved round the projecting part on the spindle is then on the underside of the fixed plate, and thus holds the two parts together in the same way that an ordinary key is held in a lock, and allows the arm to be moved sufficiently either way without coming unjointed.

21,182 of 1905.—P. LÖSCHER: *Trellis Work and Gratings Composed of Reeds, Canes, Wire, and the like.*

This invention relates to trellis work and gratings composed of reeds, canes, wire, and the like, the characteristic feature being the fact that the longitudinal rods and transverse bars forming the trellis work or the gratings are fixed in apertures provided for that purpose in tubular bodies, such as tubes made of bamboo, wood, or metal, in which they are fixed by means of a wedge driven into the tubes.

21,496 of 1905.—W. L. MARCHAND: *Wall Construction.*

This relates to a wall construction comprising a plate with angular projections extending both vertically and horizontally, a second plate parallel with the first plate, bolts connecting said plates, a strip independent of said plates, and adapted to be supported between the inner and outer plates, and a series of cones depending from said strip and having vertical slits to straddle on said bolts, said bolts being removable and adapted to engage the upper end walls of the said slits, whereby the moulds may be removed from the wall after the blocks have been formed.

22,410 of 1905.—R. EVANS: *A Down-Draught Preventer for Chimneys and Ventilating Shafts.*

This relates to a chimney cowl or down-draught preventer, consisting of the usual body surmounted by a truncated cone secured to the said body so as to leave a space between it and the body, a cylindrical piece fixed at a short distance above the said cone, inside which is an inverted cone secured above a pipe, which connects the cylinder to the cone so as to leave a space between the pipe and the cylinder, and a number of vertical wings or flaps secured to the body and pipe beneath the said cone and cylinder.

22,602 of 1905.—A. THOMAS: *Reinforced Concrete Buildings.*

This relates to reinforced concrete buildings, and consists of a bonding device formed from a flat blank of metal with longitudinal slits so arranged that by suitably bending the strips a circular part is formed which embraces the tie rod, together with outstanding arms, which are embedded in the concrete to be strengthened, together with the tie rod. The arms can be bent at an angle to the tie rod, so as to lie at right angles to the shearing stress in the concrete. In this bending the arms will perforce be caused to twist somewhat about their longitudinal axis, so that the bending stress in the arms will be approximately diagonally through their section.

23,705 of 1905.—J. F. GREGORY: *Shop Fronts, or the like.*

This relates to a shop front, or the like, and comprises a window ledge which is open at the front and is divided off at the back from the body of the shop or similar place by the use of a vertical front screen or window and by one or more high rearwardly-extending side-screens or returns, which partially enclose an accessible back space or area.

339 of 1906.—E. PRESTON: *Adjustable Cramps for Use in Making Picture Frames and other Frames.*

This relates to an adjustable cramp for use in making picture frames and the like, consisting of a series of four corner or mitre cramps having tubular or box-like guides or eyes at their corners, through which guides or eyes a tightening or cramping chain is threaded, the said chain being attached at one end to one of the corner or mitre cramps, the last-named corner or mitre cramp having attached to it a screw hook with fly or winged nut for adjusting the same, the hooked end of which screw hook engages with one of the links of the chain when the said chain has been tightened.

25,851 of 1905.—A. C. CUNNINGHAM: *Caissons for Repairing the Bottoms of Floating Structures.*

This relates to an under-water floating caisson, comprising an open-topped working chamber having a bottom and closed on two sides, said chamber being adapted to be entirely submerged and floated under the dock or other floating structure to be repaired, provided with means for exhausting the water therefrom, and having a shaft or shafts extending above the water level to permit workmen to enter the chamber after it is in place.

11,533 of 1905.—R. MIDDLETON: *Arrangement of the Equipment for Jib Cranes for Derricking and like purposes.*

This relates to the arrangement for jib for derricking and like purposes. The jib, pivoted at its foot to the mast in the usual manner, has its head attached to the mast by jointed links or side rods. These links or rods, which may be attached to any desired points on the mast and jib, are hinged or pinned together at any convenient point. This centre is attached preferably to a cross-head working in suitable slides fixed to the mast by a connecting rod. The cross-head is elevated or depressed in the slides on the mast by any suitable means, and thus the hinge is made to ascend or descend accordingly, and so lengthen or shorten the distance, whereby the jib is caused to luff in or out as required.

13,989 of 1905.—R. DALE: *Joints of Earthenware Drain Pipes.*

This relates to the construction of water-tight joints between the ends of earthenware drain pipes, and consists in the use of a bitumen or bitumenised belt placed round the junction faces of the abutting ends, and an annular space formed between the collar and each pipe surrounding said belt, and filled with cement or the like.

16,017 of 1905.—J. A. SLOAN: *Tiling.*

This relates to the manufacture of tiling and consists of a tile having lateral projections defined by intersecting curves symmetrically arranged with respect to an axis, and ends defined by curves similar to, and continuant of, said first curves, said ends being developed by the revolution of the adjacent body curves of intersection.

16,082 of 1905.—A. WOLFF: *Framework or Lathing for Use in Plastering Walls and the like.*

The object of this invention is a framework, twined or woven from iron wire, to be used in building for isolating materials, especially for the coating or lining of walls, ceilings, and pillars. The characteristic feature of this framework consists in that the single wires are provided with lateral corrugations which secure the necessary space for the framework and the respective surface, and guarantee a solid hold of the coating material of the framework. When manufactured the netting is brought immediately from the twining machine on to rollers, which rollers are provided with length grooves or length rods, and which fit together, and thereby corrugate the wires of the netting.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 9.—By THORNBOROW & CO. (at Matterdale).

Matterdale, Cumberland.—A freehold and copyhold farmhouse and 16 a. 0 r. 34 p., including an allotment and six stints (in lots)	£1,097

By HARRY BALL (at Kempston).

Kempston, Beds.—282 and 284, Bedford-rd., f., y.r. 20*l.* 16*s.*	275

March 12.—By JONES, LANG, & CO.

City.—36 and 37, New Broad-st., and 23, Broad-street-av., area 5,300 ft., building lease for 80 yrs., let at per annum	1,760

By KEMSLEYS'.

Woodford Green, Essex.—High-rd., "Woodford Lodge" (building estate), area 5½ acres, f., p.	6,000

By SOUTHON & ROBINSON.

Norwood.—9, Westow-hill (s.), u.t. 40¾ yrs., g.r. 5*l.*, y.r. 70*l.*	910
Croydon.—Wisbeach-rd., f.g.r. 10*l.*, reversion in 58¾ yrs.	200
Brixton.—374, Brixton-rd., u.t. 19¾ yrs., g.r., etc., 10*l.* 18*s.*, y.r. 72*l.*	330

By CASTLE, SON, & BOOTH (at Blakesley).

Helmdon, Northants.—A freehold farm, 107 a. 3 r. 32 p., y.r. 131*l.*	2,750
Blakesley, Northants.—A freehold farmhouse and 33 a. 3 r. 37 p.....	1,800

March 13.—By C. H. BROWN.

Pimlico.—16, Colchester-st., u.t. 27 yrs., g.r. 8*l.* 10s., e.r. 66*l.*	£415
5, Ranlagh-rd., u.t. 22 yrs., g.r. 9*l.*, e.r. 65*l.*	425
37, Cumberland-st., u.t. 27½ yrs., g.r. 8*l.*, w.r. 117*l.*	445

By DRIVERS'.

Holloway.—7, Fortnam-rd., u.t. 51 yrs., g.r. 6*l.* 6s., y.r. 32*l.*	295

By G. HEAD & Co.

Acton.—208 to 214 (even), Acton-la., u.t. 72 yrs., g.r. 25*l.*, y.r. 100*l.*	625

By SIMPSON & MOORE.

New Cross.—16 and 18, Gellatly-rd., u.t. 53 yrs., g.r. 10*l.* 10s., y.r. 64*l.*	640

By RUTLEY, SON, & VINE.

Tottenham Court-road.—31, Tottenham-st., c., y.r. 36*l.*	700
Regent's Park.—Redhill-st., "Albany Wharf," u.t. 12 yrs., y.r. 130*l.* (including machinery, plant, etc.)	700
Holloway.—Hungerford-rd., l.g.r. 8*l.* 8s., u.t. 49 yrs., g.r. 1*l.* 1s.	130
Kentish Town.—Patshull-rd., l.g.r. 8*l.*, u.t. 55 yrs., g.r. 1*l.*	130
Highbury.—22 and 24, Elwood-st., and 11 and 13, Myrtle-st., area 6,600 ft., f., y.r. 67*l.* 12s.; also f.g.r. 3*l.* 12s., reversion in 2½ yrs.	650

By WILLIS, CROUCH, & LEE.

Rotherhithe.—104, Paradise-st. (s.), f., w.r. 39*l.*	350

March 14.—By HAROLD GRIFFIN.

South Lambeth.—39 and 41, Goding-st., u.t. 52 yrs., g.r. 16*l.*, w.r. 78*l.*	410
7, 9, and 11, Simpson-st., u.t. 16½ yrs., g.r. 15*l.*, w.r. 88*l.* 8s.	165
Camberwell.—59 and 61, Paulet-rd., u.t. 61 yrs., g.r. 12*l.* 12s., y.r. 80*l.*	755
Battersea.—1, Plough-rd. (s.), u.t. 79½ yrs., g.r. 6*l.*, y.r. 35*l.*	240
2, Knox-rd., u.t. 79½ yrs., g.r. 4*l.*, w.r. 23*l.* 12s.	155
21, Grant-rd. (s.), u.t. 41 yrs., g.r. 4*l.* 10s., w.r. 33*l.* 16s.	140

By W. MAURICE-JONES.

Somers Town.—Clarendon-sq., etc., l.g.r. 300*l.*, u.t. 21 and 22 yrs., g.r. 124*l.*	2,000

By THURGOOD & MARTIN.

Hyde Park.—13, Old Quebec-st., u.t. 15 yrs., g.r. 6*l.* 13s., e.r. 120*l.*	400
Oxford-street.—7, Princes-st. (s.), u.t. 11½ yrs., g.r. 40*l.*, y.r. 180*l.*	1,050
Shepherd's Bush.—1 and 3, Leffern-rd., f., w.r. 72*l.* 16s.	570
Croydon.—High-st., "Wrencote," f., p.	2,750
Norwood.—1 to 13 (odd), Holland-ter., f., w.r. 145*l.* 12s.	1,200

By WINCH & SONS (At Cranbrook).

Cranbook, Kent.—"Turk's Place Farm," 56 a. 3 r. 23 p., f., p.	1,740
Hartley, a plot of land, 1 acre, f.	150

March 15.—By JOHN BARKER & Co.

South Kensington.—56, Redcliffe-sq., u.t. 58 yrs., g.r. 50*l.*, p.	700

By CHESTERTON & SONS.

City.—Little Britain, f.g.r. 45*l.*, reversion in 46 yrs.	970
Fulham.—566, King's-rd. (s.), u.t. 45 yrs., g.r. 5*l.* 13s. 4d., y.r. 45*l.*	300

By GLASIER & SONS.

Holloway.—103, Fairbridge-rd. (s.), u.t. 76½ yrs., g.r. 8*l.* 8s., y.r. 47*l.* 10s.	560

By HATCH & HATCH.

Catford.—167 and 169, Rushey-green (s.), f., y.r. 235*l.*	3,950
Beckenham.—Kimberley-rd., f.g. rents 25*l.* 4s., reversion in 99 yrs.	500
Norfolk-ter., f.g.r. 15*l.*, reversion in 98½ yrs.	300

By E. HOLSWORTH.

Hammersmith.—14 and 16, Dalling-rd. (s.), c., e.r. 60*l.*	895

By JENKINS, SONS, & Co.

Brockley.—21, Endwell-rd., u.t. 69 yrs., g.r. 5*l.* 5s., e.r. 36*l.*	265

By MARK LIELL & SON.

Bow.—48, 49, 50, and 51, Merchant-st., f., w.r. 143*l.*	1,245

By NEWBON, EDWARDS, & SHEPHARD.

Barnsbury.—31, Belitha-villas, f., y.r. 50*l.*	725
Crouch End.—105 to 113 (odd), Park-rd., c., e.r. 112*l.* 9s.	1,180
266, Ferme Park-rd., f., e.r. 50*l.*	550
Stroud Green.—1, Nelson-rd., u.t., 79 yrs., g.r. 11*l.*, y.r. 50*l.*	425

By STIMSON & SONS.

Kennington.—10, Hurley-rd., u.t. 21½ yrs., g.r. 4*l.*, y.r. 35*l.*	220
23 and 24, Renfrew-rd., u.t. 21½ yrs., g.r. 8*l.*, rising to 12*l.*, y.r. 36*l.*	500
Walworth.—70, East-st. (s.), f., y.r. 36*l.*	455
Peckham.—66, Hill-st., f., y.r. 30*l.*	500
72, Lugard-rd., u.t. 69½ yrs., g.r. 4*l.* 10s., p.	325
27 and 29, Queen's-rd. (s.), u.t. 77 yrs., g.r. 50*l.*, y.r. 130*l.*	1,090
Choumert-rd., f.r.g. 6*l.* 6s., reversion in 73 yrs.	170
Copleston-rd., f.g.r. 12*l.* 12s., reversion in 74 yrs.	325
Camberwell.—55, Westmacott-st., f., w.r. 36*l.* 8s.	385
Beckenham.—Parish-la., f.g.r. 15*l.*, reversion in 65 yrs.	325

By BACHELAR & SON (at Catford).

Catford.—81 and 83, Perry-hill, f., e.r. 103*l.*	810

March 16.—By G. E. LUCK.

Highgate.—Hornsey-la., "Chesnut Lodge," f., y.r. 85*l.*	1,150
Hornsey-la., "Newlyn," f., y.r. 145*l.*	2,150
Hornsey-la., "Castlemere," f., y.r. 130*l.*	1,600
Hornsey-la., "Ivanhoe," f., e.r. 130*l.*	1,775
71, Whitehall-pk., f., y.r. 89*l.*	1,110

By WAGSTAFF & SONS.

Caledonian-road.—2 and 3, Railway-st., u.t. 38½ yrs., g.r. 10*l.*, y.r. 80*l.* 14s.	460
30, Story-st., u.t. 38½ yrs., g.r. 6*l.*, w.r. 57*l.* 4s.	200
112, Bemerton-st., u.t. 38½ yrs., g.r. 5*l.*, w.r. 63*l.* 14s.	170
5 and 7, Gifford-st., u.t. 35 and 38 yrs., g.r. 12*l.*, w.r. 122*l.* 4s.	300
Holloway.—56 and 58, Alsen-rd., u.t. 59½ yrs., g.r. 5*l.* 5s., w.r. 59*l.* 16s.	320

By ORGILL, MARKS, & Co.

City.—Rood-la., "The Oriental" p.h., a freehold rental of 220*l.*, reversion in 6½ yrs.	£4,270

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MARCH 23.

Architectural Association.—Mr. A. W. Soames, M.P., on "The London Club House of Last Century." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. F. K. Stevens on "Waves." 8 p.m.

SATURDAY, MARCH 24.

Architectural Association.—Fifth spring visit, to flats in High-street, Kensington. Meet in Hornton-street 1.30 p.m.

Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter," IV. 3 p.m.

Royal Sanitary Institute.—A provincial sessional meeting to be held at the Town Hall, Leicester, when a discussion will take place on "Cremation," with particulars of the Leicester Corporation Crematorium. The discussion will be opened by Mr. C. Killick Millard, M.D., D.Sc., Medical Officer of Health, Leicester. 11 a.m.

Edinburgh Architectural Association.—Visit to the new premises of the Professional and Civil Service Supply Association, Ltd., 80, George-street.

MONDAY, MARCH 26.

Surveyors' Institution.—Adjourned discussion on paper by Mr. W. Woodward on "The Means of Locomotion and Transport in London." 8 p.m.

Society of Arts (Cantor Lectures).—Professor Vivian B. Lewes on "Fire, Fire Risks, and Fire Extinction," III. 8 p.m.

Society for the Encouragement of the Fine Arts.—Mr. H. Beaumont on "A Tour in Central France, including the Cathedrals of Bourges and Tours:" lantern illustrations. 8 p.m.

TUESDAY, MARCH 27.

Royal Institution.—Mr. J. E. Marr, M.A., F.R.S., on "The Influence of Geology on Scenery," II. 5 p.m.

Builders' Clerks' Benevolent Institution.—Annual Dinner, King's Hall, Holborn Restaurant. 6.30 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "The Outer Barrier, Hodbarrow Iron Mines," by Mr. H. Shelford Bidwell. 8 p.m.

WEDNESDAY, MARCH 28.

Architectural Association Discussion Section (Combined meeting with the Law Students' Debating Society, Law Societies' Hall, Chancery-lane).—Short Paper by Mr. W. Woodward on "The Legal Ownership of Drawings." 7.15 p.m.

Edinburgh Architectural Association.—Mr. J. Roxburgh Sharman on "Steel Building Construction; a Comparison of British and American Methods," illustrated by lantern slides. 8 p.m.

Society of Arts.—Mr. A. J. Martin on "Coal Conservation, Power Transmission, and Smoke Prevention." 8 p.m.

Institution of Civil Engineers.—Students' visit to the Works of Messrs. Price's Patent Candle Company, Ltd., Battersea, S.W.

THURSDAY, MARCH 29.

Birmingham Builders' Exchange.—Mr. W. F. Goodrich on "The Goldfields of the City," illustrated by lantern views. 6 p.m.

Institute of Sanitary Engineers.—Mr. A. E. Abbott on "Heating and Hot Water Supply," II. 7 p.m.

Royal Institution.—Professor B. Hopkinson, M.A., on "Internal Combustion Engines," II. 5 p.m.

FRIDAY, MARCH 30.

International Congress on School Hygiene.—Preliminary meeting of Second Congress, to be held in the Jehanghir Hall of the University of London, South Kensington. 5 p.m.

SATURDAY, MARCH 31.

Royal Institution.—Professor J. J. Thomson, M.A., on "The Corpuscular Theory of Matter," V. 3 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	7	0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1	4	0	" " "
Picked Stocks for Facings	2	15	0	" delivered.
Flettons	1	5	0	" at railway depôt.
Red Wire Cuts	1	11	0	" " "
Best Fareham Red	3	12	0	" " "
Best Red Pressed Ruabon Facing	5	0	0	" " "
Best Blue Pressed Staffordshire	3	15	0	" " "
Do. Bullnose	4	0	0	" " "
Best Stourbridge Fire Bricks	3	14	0	" " "
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers	12	0	0	" " "
Headers	11	0	0	" " "
Quoins, Bullnose, and Flats	16	0	0	" " "
Double Stretchers	19	0	0	" " "
Double Headers	16	0	0	" " "
One Side and two Ends	19	0	0	" " "
Two Sides and one End	20	0	0	" " "
Splays, Chamferred, Squints	20	0	0	" " "

BRICKS, &c. (continued).

	£	s.	d.	
GLAZED BRICKS (*continued*)—				
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	per 1000, at railway depôt.
Quoins, Bullnose, and Flats	14	0	0	" " "
Double Stretchers	15	0	0	" " "
Double Headers	14	0	0	" " "
One Side and two Ends	15	0	0	" " "
Two Sides and one End	15	0	0	" " "
Splays, Chamferred, Squints	14	0	0	" " "
Second Quality White and Dipped Salt Glazed	2	0	0	" less than best.

	s.	d.	
Thames and Pit Sand	6	9	per yard, delivered.
Thames Ballast	5	3	" "
Best Portland Cement	24	0	per ton, "
Best Ground Blue Lias Lime	19	0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	" "
PORTLAND STONE (20 ft. average)—			
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½	" "

	s.	d.	
Ancaster in blocks	1	10	per ft. cube, deld. rly. depôt.
Beer "	1	6	" "
Greenshill "	1	10	" "
Darley Dale in blocks	2	4	" "
Red Corsehill "	2	2	" "
Closeburn Red Freestone	2	0	" "
Red Mansfield "	2	4	" "
YORK STONE—*Robin Hood Quality.*			
Scappled random blocks.	2	10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2	6	" "
3 in. sawn two sides slabs (random sizes)	0	11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	" "
1½ in. to 2 in. ditto, ditto	0	6	" "
HARD YORK—			
Scappled random blocks.	3	0	per ft. cube, "
in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super., "
6 in. rubbed two sides ditto	3	0	" "
3 in. sawn two sides slabs (random sizes)	1	2	" "
in. self-faced random flags	0	5	" "

	s.	d.	
Hopton Wood (Hard Bed) in blocks	2	0	per ft. cube, deld. rly. depôt.
" " " 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
" " " 3 in. sawn both sides random slabs	1	0	" "
" " " 2 in. do.	0	8½	" "

SLATES.

In. In.	£	s.	d.	
20×10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20×12 " "	13	17	6	" "
20×10 first quality "	13	0	0	" "
20×12 " "	13	15	0	" "
16×8 " "	7	5	0	" "
20×10 best blue Portmadoc	12	12	6	" "
16×8 " "	6	12	6	" "
20×10 best Eureka unfading green	15	17	6	" "
20×12 " "	18	7	6	" "
18×10 " "	13	5	0	" "
16×8 " "	10	5	0	" "
20×10 permanent green	11	12	6	" "
18×10 " "	9	12	6	" "
16×8 " "	6	12	6	" "

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. "
Best Broseley tiles	50	0	per 1000 "
Do. Ornamental tiles	52	6	" "
Hip and Valley tiles	4	0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 "
Do. Ornamental do.	60	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 "
Do. Ornamental do.	54	6	" "
Hip tiles	4	1	per doz. "
Valley tiles	3	8	" "
Best "Rosemary" brand plain tiles	48	0	per 1000 "
Best Ornamental tiles	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	8	" "
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 "
Do pressed	47	6	" "
Do. Ornamental do.	50	0	" "
Hip tiles	4	0	per doz. "
Valley tiles	3	6	" "

WOOD.

BUILDING WOOD.	At per standard. £ s. d.		£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	...	15 0 0
Deals: best 3 by 9	13 0 0	...	14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	...	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0		less than 7 in. and 8 in.
Deals: seconds	1 0 0		less thn best.
Battens: seconds	0 10 0		" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	...	10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	...	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0		more than battens.
¾ in.	1 0 0		"
	At per load of 50 ft.		
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	...	5 0 0
Seconds	4 0 0	...	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	...	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	...	3 10 0
Swedish balks	2 10 0	...	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	...	3 15 0
JOINERS' WOOD.	At per standard.		
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	...	25 0 0
3 in. by 9 in.	22 0 0	...	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	...	18 0 0
Second yellow deals, 3 in. by 11 in.	18 10 0	...	20 0 0
" " 3 in. by 9 in.	17 10 0	...	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	...	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	...	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	...	12 0 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	...	22 10 0
Do. 3 in. by 9 in.	18 0 0	...	19 10 0
Battens	13 10 0	...	15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	...	17 0 0
Do. 3 in. by 9 in.	14 10 0	...	16 0 0
Battens	11 0 0	...	12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	...	14 0 0
Do. 3 in. by 9 in.	12 10 0	...	14 0 0
Battens	10 0 0	...	11 0 0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	14 10 0	...	15 10 0
" " 3 in. by 9 in.	13 10 0	...	14 10 0
Battens	11 0 0	...	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	...	14 10 0
" " 3 in. by 9 in.	12 10 0	...	13 10 0
" " battens	10 0 0	...	11 0 0
Pitch-pine: deals	16 10 0	...	20 0 0
Under 2 in. thick extra	0 10 0	...	1 0 0
Yellow Pine—First, regular sizes	44 0 0		upwards.
Oddments	32 0 0		"
Seconds, regular sizes	33 0 0		"
Yellow Pine oddments	28 0 0		"
Kauri Pine—Planks, per ft. cube	0 3 6	...	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	...	0 3 6
Small " "	0 2 6	...	0 2 9
Wainscot Oak Logs, per ft. cube	0 5 0	...	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	...	0 0 9
¼ in. do. do	0 0 7	...	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	...	0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	...	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	...	0 1 0
Teak, per load	17 0 0	...	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	...	0 5 0
Prepared Flooring, etc.—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 6	...	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	...	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	...	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	...	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	...	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	...	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	...	0 13 6
1 in. by 7 in. " "	0 14 0	...	0 18 0
¾ in. by 7 in. white " "	0 10 0	...	0 11 6
1 in. by 7 in. " " "	0 12 9	...	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	...	7 10 0
Compound Girders, ordinary sections	9 0 0	...	10 0 0
Steel Compound Stanchions	12 0 0	...	13 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	...	10 0 0
Flitch Plates	9 0 0	...	10 0 0
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	...	8 10 0

METALS.

IRON—	Per ton, in London. £ s. d.		£ s. d.
Common Bars	8 0 0	...	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	...	9 0 0
Staffordshire "Marked Bars"	10 10 0	...	—
Mild Steel Bars	8 15 0	...	9 0 0
Hoop Iron, basis price	9 5 0	...	9 10 0
" " Galvanised	17 0 0	...	—

(*And upwards, according to size and gauge.)

Sheet Iron Black— Ordinary sizes to 20 g.	9 10 0	...	—
" " 24 g.	10 10 0	...	—
" " 26 g.	12 0 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14 0 0	...	—
Ordinary sizes to 22 g. and 24 g.	14 10 0	...	—
" " 26 g.	15 0 0	...	—

METALS (*continued*).

IRON (*continued*)—	Per ton, in London. £ s. d.		£ s. d.
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	17 0 0	...	—
" " 22 g. and 24 g.	17 10 0	...	—
" " 26 g.	19 0 0	...	—
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	14 0 0	...	—
" " 22 g. and 24 g.	14 10 0	...	—
" " 26 g.	15 15 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 10 0	...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 10 0	...	—
" " " 26 g.	14 15 0	...	—
Cut Nails, 3 in. to 6 in.	9 10 0	...	9 15 0

(Under 3 in., usual trade extras.)

LEAD, &c.	Per ton, in London. £ s. d.		£ s. d.
LEAD—Sheet, English, 3lb. and up.	18 15 0	...	—
Pipe in coils	19 5 0	...	—
Soil pipe	21 15 0	...	—
Compo pipe	21 15 0	...	—
ZINC—Sheet— Vieille Montagne ton	32 10 0	...	—
Silesian	32 0 0	...	—
COPPER— Strong Sheet per lb.	0 1 0	...	—
Thin " "	0 1 1	...	—
Copper nails "	0 0 11	...	—
BRASS— Strong Sheet "	0 0 11	...	—
Thin " "	0 1 0	...	—
TIN—English Ingots "	0 1 8	...	—
SOLDER—Plumbers' "	0 0 8	...	—
Tinmen's "	0 0 10	...	—
Blowpipe "	0 0 11	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d.	per ft.	delivered.
" fourths	1½d.	"	"
21 oz. thirds	3½d.	"	"
" fourths	2½d.	"	"
26 oz. thirds	4½d.	"	"
" fourths	3½d.	"	"
32 oz. thirds	5d.	"	"
" fourths	4½d.	"	"
Fluted Sheet, 15 oz.	3½d.	"	"
" 21 oz.	4½d.	"	"

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2d.	per ft.	delivered.
¼ "	2½d.	"	"
⅜ "	2½d.	"	"
Figured and Oxford Rolled "Oceanic" Glass, white	4d.	"	"
Do. " tinted	5½d.	"	"

OILS, &c.		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 10
" " " in barrels	"	0 1 11
" " " in drums	"	0 2 1
Boiled " " in pipes	"	0 2 0
" " " in barrels	"	0 2 1
" " " in drums	"	0 2 3
Turpentine in barrels	"	0 4 0
" in drums	"	0 4 2
Genuine Ground English White Lead	per ton	22 10 0
Red Lead, Dry	"	21 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

Remittances (payable to J. MORGAN) should be addressed to The Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post*.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERGWILI.—For erecting a dwelling-house at Cefnhenllan Farm, for Mr. William Williams, Cefnhenllan Abergwili, Carmarthenshire. Mr. Gad Protheroe, surveyor, Llangynoch, Carmarthenshire:—

Mason's Work.

L. Evans	£176 10 0	T. Lewis, White Mill, Abergwili*	£126 10 7
D. Lewis	163 10 0		
D. Rees	160 0 0		

Carpenter's Work.

D. Jones	£168 0 0	J. Thomas, Pantffordd, Llanpumpsant*	£142 10 0
J. Daniel	157 0 0		
J. Davies	152 10 0		

ALNWICK.—For covered service reservoir at Sturton Grange, for the Rural District Council:—
C. Thompson & Son, Alnwick £380 0 0

ALNWICK.—For a twelve-bed small-pox hospital, for the Rural District Council:—
J. & G. Green, Warkworth, Acklington .. £759 10 0

ANNAN (N.B.)—For erecting a hall and a vestry for Erskine U.F. Church. Mr. E. Tweedie, architect, Lady-street, Annan:—
H. Kerr & Son, Butts-street, Annan* £550

BAGTHORPE.—For erecting at Bagthorpe workhouse a sanatorium for females, for the Guardians. Mr. A. Marshall, architect, King-street, Nottingham:—
J. G. Short, Sneinton, Nottingham* .. £1,192 10
[Twelve tenders received.]

CARSHALTON.—For woodwork and kitchen fittings at the Southern hospital, Carshalton-on-the-hill, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

Kirk & Randall	£419 0	G. E. Wall's & Sons, Ltd.	£327 0
W. Summerscales & Sons, Ltd.	411 10	W. Johnson & Co., Ltd., Wandsworth Common, S.W.*	320 0
Dix, Jones, & Co.	395 0		
T. Potter & Sons, Ltd.	369 0		
R. Lisles & Sons	345 15		

CONSETT.—For Consett Baptist Church and Schools. Messrs. George Baines & Son, architects, 5, Clement's-inn, Strand, London, W.C.:—

—	Estimate A. £ s. d.	Estimate B. £ s. d.	Total. £ s. d.
Middlemiss Bros.	3,188 2 8	1,794 0 8	4,982 3 4
J. Robson	2,720 0 0	1,570 0 0	4,490 0 0
E. R. Davison	2,922 8 7	1,530 17 3	4,453 5 10
North Durham Stone Co.	2,777 8 7	1,537 17 7	4,315 6 2
J. B. Stott	2,900 0 0	1,370 0 0	4,270 0 0
E. Taylor	2,731 12 6	1,485 10 1	4,217 2 7
W. Ayton & Sons	2,598 8 4	1,595 9 5	4,193 17 9
J. Guthrie & Son‡	2,639 8 6	1,343 14 0	3,983 2 6

‡ Accepted with modifications for estimate A.

DARTFORD.—For York-road girls' Council Schools, for Kent Education Committee:—

—	New Girls' Schools. £	Boys' Playsheds. £	Total. £
W. Pollock	8,778	170	8,948
F. Johnson	7,654	139	7,793
R. Avard	7,595	150	7,745
W. J. Adcock	7,506	147	7,653
Thomas & Edge	7,420	160	7,580
Mattock & Parsons	7,399	147	7,546
W. H. Archer & Son	7,389	144	7,533
J. & M. Patrick	7,390	130	7,520
W. Smith & Son	7,257	138	7,395
F. & G. Foster	7,226	134	7,360
F. Gough & Co.	7,184	140	7,324
Friday & Ling	7,150	145	7,295
W. F. Blay	7,050	132	7,182
J. Guttridge	6,985	172	7,157
J. Ellingham & Sons	7,000	130	7,130
Gann & Co.	6,967	140	7,107
J. Lonsdale	6,948	138	7,086
Wallis & Sons, Ltd.	6,838	131	6,969
J. E. Johnson & Son, Westminster*	6,769	135	6,904

TENDERS—*Continued on page 335.*

List of Contracts, etc.

CONTRACTS.

(For some Contracts still open, but not included in this List, see previous issues.)

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Granite, Flints, etc.	East Grinstead U.D.C.	W. E. Woollams, Eng., Coun. Offices, London-rd., E. Grinstead	Mar. 26
Cement Path Work	Gateshead Borough Council	W. Swinburne, Town Clerk, Gateshead	Mar. 27
Plumbing and Electric Lifts at Technical Institute	Belfast Library, etc., Com.	S. Stevenson, Architect, 83, Royal-avenue, Belfast	do.
Rebuilding part of Boundary Wall, Booth Town-road	Halifax Parks Committee	J. Lord, Borough Engineer, Town Hall, Halifax	do.
1,200 yds. of Unclimbable Iron Fencing	Mountain Ash U.D.C.	Surveyor, Town Hall, Mountain Ash	do.
Electric Lighting of Montgomery-street, Housing Scheme Buildings	Dublin Lighting Committee	City Electrical Engineer, Fleet-street, Dublin	do.
Painting, etc., Methodist Free Church, Armley	.....	M. Akers, 101, Town-street, Armley	do.
Yarm Church, New Vestry	.....	Wright & Son, Surveyors, Lancaster	do.
Pumping Machinery for Artesian Well, Tiverton-road, Selly Oak	King's Norton, etc., U.D.C.	W. M. Binny, Consult. Eng., 23, Valentine-rd., King's Heath	do.
Smith & Ironfounders' Wk. for Steel Roof., etc., Stroud Grn. Well	Croydon Corporation	Borough Engineer, Town Hall, Croydon	do.
*COLLEC., REMOVAL, AND DISPOSAL OF HOUSE REFUSE	Willesden District Council	Council's Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
*SURFACE WATER CULVERT, NR. GLADSTONE PARK	do.	do.	do.
*BOUNDARY WALL, ISOLATION HOSP. GRDS., NEASDEN	do.	do.	do.
*ROADMAK. & PAV. WKS., CRICKLEWOOD & HARLESDEN	do.	do.	do.
*ERECTION OF NEW SCHOOL IN FULLEDGE	County Borough of Burnley	Borough Surveyor, Town Hall, Burnley	do.
Road Material and Carting	Whiston R.D.C.	R. J. Knapman, Surveyor, Delph-lane Offices, Whiston	Mar. 28
Stores	do.	do.	do.
Alterations to Buildings, Baldwin-street, Bristol	Dunlop, Mackie, & Co., Ltd.	H. Williams, Architect, Alliance-chambers, Corn-st., Bristol	do.
Additions, etc., to Wrenbury School-buildings, near Nantwich	Chester Sub-Com. Nantwich	H. Beswick, County Architect, Newgate-street, Chester	do.
Granite	Hellaton R.D.C.	J. H. Douglass, Clerk, Market Harborough	do.
Alterations, etc., to Grammar School, Hipperholme	.....	J. F. Walsh & J. Nicholas, Archs., Museum-cham., Halifax	do.
Stores	Rochdale Paving, etc., Com.	Borough Surveyor's Office, Town Hall, Rochdale	do.
40 lineal yds. of Intercepting Sewer, etc	Barton-upon-Irwell R.D.C.	Mr. Hooley, C.E., Union Offices, Patricroft	do.
Improvements to Road between Miskin and Cornel-y-parc	Llantrisant, etc., R.D.C.	G. S. Morgan, Surveyor, School-street, Pontychin	do.
Stoneware Pipe and Surface Water Drains	do.	do.	do.
Stores, etc.	Manchester Cleansing Com	R. Williamson, Town Hall, Manchester	do.
Road Materials	Cranbrook R.D.C.	T. H. Crampton, Clerk, Cranbrook, Kent	do.
415 yds. of 9-in. Sanitary Pipe Sewer, Brompton	Northallerton R.D.C.	W. Fowle, Clerk, Northallerton	do.
110 yds. of 6-in. Sanitary Pipe Sewer, Brompton	do.	do.	do.
1,600 yds. of Pipe Sewers, Washwood Heath-road, etc.	Birmingham Public Wks.Com.	T. Arnall, Council House, Birmingham	do.
Redraining Gosforth Police-station	Northumberland Co. County	J. A. Bean, County Architect, Moot Hall, Newcastle-on-Tyne	do.
520 yds. of 9-in. Stoneware Pipe Sewer	Braintree U.D.C.	H. H. Nankwell, Surveyor, Vestry Hall, Braintree	do.
Granite Spalls	West Ham Guardians	F. E. Hilleary, Clerk, Union Workhouse, Leytonstone, N.E.	do.
Portland Cement	Guildford Town Council	C. G. Mason, Borough Surveyor, Tunsgate, Guildford	Mar. 29
Road Materials	Guildford Corporation	do.	do.
Sewage Pumping Plant	Chippenham U.D.C.	A. E. Adams, Borough Engineer, Chippenham, Wilts	do.
Electric Motors	Stockport Electricity Com.	A. J. H. Carter, Electricity Works, Milligate, Stockport	do.
Improvements in Eastfield-lane, Castleford	Castleford U.D.C.	W. Green, Surveyor, Castleford	do.
Alterations to Premises, Duke-street and St. John-square, Cardiff	Messrs. Fulton & Dunlop	E. H. Bruton, Architect, 119, Queen-street, Cardiff	do.
Street Works, Coulsdon	Croydon R.D.C.	R. M. Chart, F.S.I., Town Hall, Croydon	do.
Street Works, Sanderstead	do.	do.	do.
Materials	Lytham U.D.C.	A. J. Price, Surveyor, Lytham	do.
Cricket Pavilion, Toolhouse, etc., Meadow's Recreation Ground	Nottingham Park Committee	F. B. Lewis, City Architect, Guildhall, Nottingham	do.
270 tons of Hard Clinker Ashes and 100 yds. of Land Drains	Ruislip-Northwood U.D.C.	W. Louis Carr, Surveyor, Council Offices, Northwood	Mar. 30
Alterations to No. 13, High-street, Banbury	Banbury Municipal Charities	A. E. Allen, Architect, 31a, Bridge-street, Banbury	do.
Watering Greens of Moray Golf Course	.....	J. Wittet, Architect, Elgin	do.
Painting Two Bridges over the River Irwell	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Hall and Assembly-room, Penarth	.....	J. Coates Carter, Bank-buildings, St. Mary-street, Cardiff	do.
Widening, etc., of Swainby Beck Bridge, Swainby	North Riding County Council	W. G. Bryning, County Surveyor, Northallerton	do.
Sewer between Lowgate and Quay-street	Hull Corporation	A. R. White, City Engineer, Town Hall, Hull	do.
Additions to Workhouse, Atcham, Shrewsbury	Atcham Guardians	Union Offices, St. John's-hill, Shrewsbury	do.
Primitive Methodist Church, Ellenborough, Cumberland	.....	W. G. Scott & Co., Architects, Victoria-buildings, Workington	do.
Alteration of the Hall, Gomersal, Yorks	Mr. G. H. Oldroyd	F. W. Ridgway, Architect, 11, Union-street, Dewsbury	do.
Highway Repairs	Newbury R.D.C.	H. S. Talbot, District Surveyor, Coldash, Newbury	do.
450 tons of Steel Tram Rails, and 21 tons of Fishplates	Nottingham City Council	A. Brown, City Engineer, Nottingham	Mar. 31
250 Tramway Poles and Fittings	do.	do.	do.
10,000 tons of Granite Setts	do.	do.	do.
Norway Granite Kerb and Setts and Yorkstone Edging	Essex County Council	P. J. Sheldon, Chief Surveyor, Chelmsford	do.
Golf Pavilion on Ogmore Down, near Bridgend	Ogmore Golf Society	Linton & Barker, Architects, Newport, Mon.	do.
Cleaning and Decorating Interior of Workhouse Chapel	Derby Guardians	N. Twigge, Clerk, Poor Law Offices, Derby	do.
Hauling Materials	Bredwardine R.D.C.	H. B. Hamar, Surveyor, Bricklands Hay	do.
Twelve Houses, Spring-gardens, Burnley-road, Sowerby Bridge	.....	H. Thompson, Architect, Southgate-chambers, Elland	do.
Blue Stone and Slag	Pocklington R.D.C.	T. Robson, Clerk, Pocklington	do.
Broken and Unbroken Whinstone	Croft R.D.C.	C. H. Leach, Clerk, Union Offices, Darlington	do.
Colliery Offices, Cwmaman, Aberdare	Cwmaman Coal Company	Morgan & Elford, Architects, 1, Jeffrey-street, Mountain Ash	do.
50 Cottages, Tonnadefaid Estate, Nantyffyllon, Maesteg	Building Club	Mining Offices, Maesteg	do.
Alterations, etc., to School Conveniences, Thwaite-street, etc.	Barrow-in-Furness Corporatn.	Borough Engineer's Offices, Town Hall, Barrow-in-Furness	do.
Church Restoration, Cleeve Prior	.....	C. Ford Whitcombe, Architect, Newbury, Broadheath, Worcs.	do.
Converting Old Buildings into Stables, Spital Bridge	Whitby U.D.C.	T. K. Scott, Council Offices, Flowergate, Whitby	do.
Six Houses in Flats, Station-road, Wallsend	Industrial Co-operative Soc.	F. Robertson, Sec., Carville-road, Wallsend-on-Tyne	do.
Making-up Streets	Bexhill Corporation	G. Ball, Borough Surveyor, Town Hall, Bexhill	do.
Materials	Faversham Corporation	S. P. Andrews, Borough Surveyor, 20, West-street, Faversham	do.
150 cwt. of Lead Pipes, etc.	Brimsby & Frodingham U.D.C.	J. Green, Surveyor, Council Offices, Frodingham, Doncaster	do.
Materials	Swinton & Pendlebury U.D.C.	H. Entwisle, Eng. & Surv., Coun. Offices, Swinton, Manchester	April 2
Flints, Gravel, Cement, Road Rolling, and Timber	Bognor U.D.C.	O. A. Bridges, Surveyor, Bognor	do.
*MAKING-UP ROADS	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
Wesleyan Church and Schoolroom at Chilsworthy	.....	R. Leverton, Delaware-road, Gunnislake	do.
Business Premises, Doncaster-gate and Wellgate, Rotherham	.....	J. Platts, Architect, High-street, Rotherham	do.
600 cubic yds. of Concrete Walling at Bell's Close	Newburn U.D.C.	T. Gregory, Engineer, Newburn	do.
180 yds. of Iron Palisading at Bell's Close	do.	do.	do.
1,200 yds. of Palisading at Lemington and Newburn	do.	do.	do.
Twenty-five Cottages at Rhydfelen	Pontypridd U.D.C.	P. R. A. Willoughby, Surv., Dis. Council Offices, Pontypridd	do.
300 cubic yds. of heavy Retaining Wall, Pontypridd	do.	do.	do.
50 yds. of Fence Wall, Ynysyngharad-road	do.	do.	do.
15 tons Cast-iron Cyclinders and 260 tons Cast-iron Socket Pipes	Hambledon R.D.C.	B. B. Grantham & Son, Engs., 23, N'thumberl'd-av., London	do.
Smallpox Hospital, near Thornley, Co. Durham	Easington, etc., Joint Hos. Bd.	J. Stones, Architect, Sedgefield	do.
2,000 yds. of Pipe Sewers, Higham Ferrers, Northants	Corporation	Sharman & Archer, Surveyors, Wellingborough	April
Stoneware Pipe Sewer, near the Green, Leigh	Sevenoaks R.D.C.	G. F. Carnell, Clerk, Sevenoaks	April
Stores	Glasgow Tramways Com.	Purchasing Department, 46, Bath-street, Glasgow	do.
Works and Materials	Sunderland Corporation	Borough Engineer, Town Hall, Fawcett-street, Sunderland	do.
Improvements at Hilda Colliery Waggonway, Station-road	South Shields Corporation	S. E. Burgess, Boro. Engin. & Survey., Chapter-row, S. Shields	do.
Materials	Ticehurst R.D.C.	W. N. Wood, Surveyor, Ticehurst, Sussex	do.
70 fathoms of Swedish Yellow Deal and Battenends	Gravesend Guardians	W. J. King, Clerk, Town Hall Buildings, Gravesend	do.
Annual Contracts	Herne Bay U.D.C.	F. W. J. Palmer, Surveyor, Town Hall, Herne Bay	do.
Materials	Tenterden R.D.C.	W. L. C. Turner, District Surveyor, Tenterden, Kent	do.
450 tons of Granite	Woodhall Spa U.D.C.	J. E. Chatterton, Clerk, Church-lane, Horncastle	do.
PAINTING, ETC., WORKS, N.W. FEVER HOSP., HAMPSTEAD	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	April 5
Condensing Water Supply Works, etc.	Hackney Borough Council	R. Hammond, Engineer, 64, Victoria-st., Westminster, S.W.	do.
Drainage at Workhouse	Monmouth Guardians	E. J. Davies, Architect, Hereford and Monmouth	do.
Materials	Fenton U.D.C.	S. A. Goodall, Surveyor, Town Hall, Fenton	do.
Macadam	do.	do.	do.
*ALTERS. TO HEATING AND HOT-WATER AT INFIRMARY	Kensington Guardians	Clerk to Guardians, Marlves-road, Kensington, W.	April
*WATER WORKS	Brixham U.D.C.	W. Vanstone, Engineer, Palace-chambers, Paignton	April
Broken Limestone and Gravel for Road Maintenance	Magor & St. Mellon's R.D.C.'s	L. Thomas, Clerk, Union Offices, Queen's-hill, Newport, Mon.	do.
Two Tip Waggons, Two Street Watering Vans, and Three Carts	Bedford Streets Committee	Borough Surveyor, Town Hall, Bedford	do.
Stone, etc., and Cartage	Wrotham U.D.C.	A. J. H. Powell, Surveyor, Borough Green, Sevenoaks	do.
First Part of Observation Block at Dialstone-lane Hospital	Stockport Corporation	G. H. Brady, Arch., Boro.-chmbs., St. Petersgate, Stockpt.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Hauling Stone	Kington R.D.C.	F. Exton, Surveyor, Broxwood, Pembridge	April 9
Materials	Worsley U.D.C.	J. A. Corson, Surv., District Offices, Hilton-lane, Walkden	do.
Extension of Heading in Well, Lining of Well, etc.	Hambledon R.D.C.	R. B. Grantham & Son, Engs., 23, N'thumberl'd-av., London	do.
*PUBLIC LIBRARY	Cheshunt U.D.C.	J. Myrtle Smith, Architect, 8, Trafalgar-square, Chelsea, S.W.	do.
Four Cottages, Brede	Hastings Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings	April 10
Gasholder, Tank, and Spiral-guided Gasholder	St. Neots Gas Co.	The Manager	do.
*IMPROVEMENTS TO SCHOOL, DEPTFORD, S.E.	London County Council	Education Offices (Archts. Dept.) Victoria-embankmt., W.C.	do.
Granite, Picked Stones, etc.	Bosmere and Clayton R.D.C.	G. Fiske, Surveyor, Red House, Coddenham, Ipswich	April 11
Taff-street, Treherbert	Rhondda U.D.C.	Public Offices, Pentre	April 12
*SUPPLY OF SHEET LEAD	Hartley Wintney Union	Clerk to Guardians, Odiham, Hants	do.
*NURSES' HOME	Coventry, etc., Hos. Committ.	H. W. Chattaway, Architect, Trinity Churchyard, Coventry	April 23
*FURNITURE ETC., CO. LUN. ASY., BARMING HEATH	Kent County Asylum Com.	W. J. Jennings, Architect, 4, St. Margaret's-st., Canterbury	April 26
Three Circular Tanks, Catchpits, Conduits, etc., Rhodes	Middleton Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton	April 30
Primitive Methodist Sunday-schools, Silver Royd Hill, Wortley	.....	Davidson & Phillipson, Architects, Pearl-bldgs., Nwct.-on-T.	No date.
Wesleyan Church, Armley	.....	W. J. Morley & Son, Architects, 269, Swan-arcade, Bradford	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CLERK OF WORKS	Fulham Guardians	3*l.* 13*s.* 6*d.* per week	Mar. 29
*ARCHITECT OR DRAUGHTSMAN	W. Sussex, etc., Jt. Educ. Com.	120*l.*	No date.

AUCTION SALES.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD VILLAS, ETC.—Torrington Hotel, North Finchley	Charles Sparrow & Son	Mar. 26
*FREEHOLD WORKSHOPS, HODDESDON—Bull Hotel, Hoddesdon	C. H. Ashford	Mar. 28
*STOCK OF BUILDERS', ETC., 34, TRANQUIL VALE, BLACKHEATH.—On the premises	Henry W. Figg & Son	Mar. 28, etc.
*BUILDING SITE, HAYMARKET, S.W.	May & Rowden	Mar. 29
*SHOPFITTER'S, ETC., STOCK, 9A, VALLANCE-ROAD, E.—On the Premises	W. F. Laing	do.
*FREEHOLD BUILDING LAND, SHEERNESS—At the Mart, E.C.	Tuckett & Son	April 2
*FREEHOLD PROPERTY, EUSTON-ROAD, N.W.—At the Mart	Edwin Fox & Bousfield	April 4
*THE HOLBORN TOWN HALL, GRAY'S INN-ROAD, W.C.—At the Mart	Jones, Lang, & Co.	April 9
*FREEHOLD BUILDING LAND, SYDENHAM—At the Mart	Debenham, Tewson, & Co.	April 10
*FREEHOLD BUILDING LAND, STAMFORD HILL—At the Mart	F. W. Hobson	April 11
*BRICKWORKS AND BUILDINGS AS GOING CONCERN—Bordon Camp, Hants	R. C. S. Evennett	April 18
*FREEHOLD BUILDING SITE, MILE END-ROAD—At the Mart	S. Walker & Son	April 20
*FREEHOLD BUILDING SITE, TOTTENHAM COURT-ROAD—At the Mart	Ventom, Bull, & Cooper	May 4
*RESIDENTIAL ESTATES, RUISLIP PARK, NR. HARROW—At the Mart	Ventom, Bull, & Cooper	do.
*FREEHOLD RESIDENCE, ETC., ALDERSHOT LODGE—At the Mart	Driver, Jonas, & Co.	May 8

* *Those with an asterisk are advertised in this number*: *Competitions*, —; *Contracts*, iv. vi. viii. x.; *Public Appointments*, xviii. *Auction Sales*, xxviii.

TENDERS.—*Continued from page* 333.

DUDLEY.—For erecting a galvanised iron cottage at the Infectious Diseases Hospital, Blower's Green, for the Corporation of Dudley. Mr. John Gammage, Borough Surveyor, Town Hall, Dudley:—

Iron Building.

Ginger, Lee, & Co., Longsight, Manchester* £135 0

Foundations and Fittings.

M. Round, New-street, Dudley 96 10

ENFIELD.—For making-up Leighton-road, Bush Hill Park, for the Urban District Council. Mr. R. Collins, Surveyor, Public Offices, Enfield:—

T. Adams	£997 0	J. Jackson	£899 0
Fry Bros.	946 17	E. J. Betts, Enfield Highway*	885 0
Hardy, Bate, & Co.	926 12		

GOLBORNE.—For enlargement of Golborne Church:—

J. Ellison	£1,068 0 0	H. Owen & Co.	£811 14 6½
Webster & Winstanley	1,020 0 0	Rathbone & Sons, Atherton, Manchester*	901 6 0
Platt & Balshaw	1,013 10 0		
J. Peet	1,002 0 0		

GUILDFORD.—For eighteen semi-detached cottages on the Woodbridge Estate, for the Woodbridge Cottage Club. Messrs. Houston & Houston, architects, 148, High-street, Guildford. Quantities by Messrs. McEwan & Washburn, M.Q.S.A.:—

Chinchen & Son	£6,950 0 0	E. C. Hughes	£5,990 0 0
J. Lawrence	6,799 0 0	A. & F. Gammon	5,990 0 0
T. G. Hawkins	6,790 0 0	Mitchell Bros.	5,964 0 0
R. Smith	6,700 0 0	W. Lawrence & Sons	5,875 0 0
W. Smith & Sons	6,697 0 0	G. Kemp	5,716 0 0
Swayne & Son	6,350 0 0	Martin, Wells, & Co.	5,670 0 0
Higlett & Hammond	6,297 0 0	G. Willis	5,286 0 0
R. Wood & Son	6,150 0 0	A. Franks	5,262 16 6
J. Smith & Sons	6,087 0 0	Tribe & Robinson	5,250 0 0
C. Ansell	6,060 0 0	W. Mercer, Guildford‡	4,950 0 0
Hefer & Co.	6,050 0 0		
Tompsett & Co.	6,000 0 0		
Drewley & Co.	5,999 0 0		

‡ Accepted on reduction estimate, £4,418.

KENDAL.—For 900 yds. lineal of pipe sewers, for the Corporation. Mr. R. H. Clucas, Borough Engineer, Kendal. Quantities by the Borough Engineer:—

W. Carradice	256 11 1	R. Woodburn, Kendal*	£240 13 6
T. & W. Dirken	245 14 2		

GORSEINON.—For erecting twenty houses on Gorswaddau estate. Mr. C. T. Ruthen, architect, Bank-chamberrs, Heathfield-street, Swansea:—

T. D. Jones	£4,500 0	Fuge & Rosser	£3,510 10
A. & A. Thomas	4,300 0	H. Billings	3,610 0
W. Rogers & Sons	4,180 0	Rees, Thomas, & Sons	3,387 0
Thomas & Jones	4,100 0	J. Fry	3,380 0
Thomas Bros.	3,980 0	B. & D. C. Jones	3,260 0
W. Lacy	3,875 15	T. Lewis, Gorseinon*	3,200 0
Morgan & Gough	3,990 0		

LEEDS.—For proposed new branch post office and sorting office, Hyde Park-corner, for Commissioners of H.M. Works and Public Buildings:—

W. Wade & Co.	£3,962 9 9	Armitage & Hodgson	£3,490 9 0
W. Irwin & Co., Ltd.	3,650 0 0	T. Hannam & Sons	3,369 0 0
R. Costain & Sons	3,596 0 0	W. Wilson & Sons	3,337 0 0
W. Nicholson & Son	3,591 17 5	T. Blakey	3,285 0 0
H. Atkinson & Sons	3,579 0 0	J. Wood & Son	3,279 0 0
W. H. Dews & Co.	3,569 0 0	C. Myers & Sons	3,255 0 0
		J. F. Wright	3,240 12 6
		J. Pullan*	3,000 0 0

LONDON.—For the division of rooms, Lyndhurst-grove, Dulwich, for the London County Council Education Committee:—

T. G. Sharpington	£328	J. Garrett & Son	£248
H. Burman	325	H. Bragg & Sons	233
W. Downs	309	W. Johnson & Co., Ltd., Bellevue-road, Wandsworth Common*	193
Rice & Son	292		
H. Bouneau	272		
J. Marsland & Sons	263		
H. Line	249		

[The Architect's (Education) estimate, comparable with these tenders, is £295.]

LONDON.—For the erection of shops and flats at the corner of Weston-street, and Snowsfields, Bermondsey. Messrs. Rings & Myers, architects, 21, Railway-approach, London Bridge. Quantities by Messrs. Campbell & Sons, 4, Finsbury-circus:—

Holland & Hannen	£19,818	Smith & Sons	£18,214
Spencer, Santo, & Co.	19,300	Carmichael	18,142
W. Downs	19,140	Patman & Fotheringham	17,973
Colls & Sons	18,765	G. Darlington‡	17,800
Higgs & Hill	18,484	F. & H. F. Higgs	17,250
Holloway Bros.	18,450	Greenwood Ltd.	17,181

‡ Arrived late.

LONDON.—For external painting and repairs at the Norwood schools, for the Lambeth Guardians. Messrs. Woodward, Brooks, & Latter, surveyors, 69, Kennington-oval, S.E.:—

		Weeks.
E. H. Holtham	£1,762 17 9	22
W. King & Son	1,060 0 0	—
S. E. Moss & Co.	998 10 0	12
J. Mitchell	975 0 0	15
J. H. Pincock	755 0 0	20
Greenhill & Markham	735 0 0	12
Hammond & Son	675 0 0	12
H. Gent	665 7 0	—
W. A. King	650 0 0	10
J. J. Richards	648 0 0	12
Crabb & Son	630 0 0	8
Hibberd Bros., Ltd.	590 0 0	10
R. Woolaston & Co.	590 0 0	7
J. S. Fenn	589 0 0	5
Woolaston Bros.	568 0 0	6
G. A. Rowley	562 10 0	10
A. Heritier & Co.	548 0 0	—
G. E. Berridge	545 0 0	10
H. Bragg & Sons	541 0 0	8
A. Porter	532 0 0	12
L. Kazak	525 0 0	10
E. McCarthy	499 0 0	13
R. Brown	469 0 0	5
W. Johnson & Co., Ltd.	458 0 0	6
H. Smith	420 0 0	12
W. Hussey, Kensington Gore, S.W.*	337 0 0	8

LONDON.—For improvements, Clifton-hill boys' and girls' school, Deptford, for the Education Committee of the London County Council:—

Enness Bros.	£10,788 0 0
J. Longley & Co.	9,792 18 0
F. & H. F. Higgs	9,741 0 0
W. H. Lascelles & Co., Ltd.	9,703 0 11
H. Lovatt, Ltd.	9,533 0 0
H. L. Holloway	9,525 0 0
W. Harris	9,309 0 0
Clarke & Bracey	9,297 0 0
J. Appleby & Sons	9,271 0 0
Kirk & Randall	9,198 0 0
W. Downs	9,100 0 0
E. Lawrance & Sons	9,098 0 0
Treasure & Son	8,985 0 0
T. G. Sharpington	8,984 0 0
J. & C. Bowyer	8,687 0 0
G. E. Wallis & Sons, Ltd.	8,664 0 0
T. D. Leng, Czar-street Works, Evelyn-street, Deptford*	8,631 0 0

[Architect's estimate, comparable with these tenders, is £10,253.]

LONDON.—For roadworks, part of Longhurst-road, Lewisham, for the Lewisham Borough Council:—

Kerbing and Channelling.

W. Pearce, Forest Hill..... £966

Paving Footways.

Queenborough Cement Co., Ltd. £318 10

LONDON.—For side slot rails and bolts for the reconstruction of portion of first section of northern tramway lines, for the London County Council:—

P. & W. MacLellan, Ltd. £3,640 3
Steel, Peech, & Tozer, Ltd..... 3,640 14
Frodingham Iron and Steel Co., Ltd., Frodingham, near Doncaster* 2,750 1

[Estimate, comparable with tenders, £2,914 12s.]

NUNEATON.—For constructing a service reservoir, capacity 500,000 gallons, in Hennebique's ferro-concrete construction, for the Nuneaton and Chilvers Coton Urban District Council. Mr. F. C. Cook, Waterworks Engineer, Council Offices, Nuneaton:—

Hobrough & Co. £2,631 10 1
Yorkshire Hennebique Contracting Company, Ltd. 2,575 0 0
Liverpool Hennebique Ferro-Concrete Contracting Company, Ltd., Liverpool* 2,503 5 9

POOLE.—For two and three-quarter miles of 10-in. cast-iron main pipes, etc., for Poole Waterworks Company. Mr. H. F. J. Barnes, engineer, Towngate-street, Poole:—

		Laying, Jointing, and Labour.
I. Dean	£4,260 0 0	—
J. T. Whettam, Junr.	4,022 0 0	—
R. H. B. Neal, Ltd.	3,742 0 0	—
A. & F. Wilson ..	3,737 0 0	£930 0 0
Jesty & Baker	3,732 3 0	1,200 19 0
Napier & Sons	3,701 15 11	763 15 11
Harrison & Co.....	3,590 0 0	—
J. Aird & Son	3,560 6 0	—
Cunningham & Co.	3,552 15 0	—
S. Ambrose	3,507 0 0	900 0 0
D. H. Porter.....	3,499 0 0	—
Construction Co. ..	3,476 7 6	940 0 0
Jenkins & Son	3,435 18 6	—
W. P. Saunders ..	3,434 0 0	—
W. Doleman.....	3,383 9 0	919 12 0
Dean & Co.	3,379 5 0	1,062 15 0
Rowell & Son	3,358 1 8	942 7 0
Davis, Ball, & Co.	3,300 0 0	—
Clay Cross Co.	3,300 0 0	—
T. C. Rigler	—	1,036 0 0
J. Burns	—	800 0 0
Merideth Bros., Gloucester*	3,050 0 0	—

RHOS.—For sewage disposal works, Rhos, Wrexham, for the Wrexham Rural District Council. Mr. J. Price Evans, C.E., Argyle-chambers, Wrexham:—

J. B. Woolley	£4,509 8 2	Davies Bros..	£3,209 19 1
I. Jenkins ..	4,382 9 11	J. Moffat....	3,062 16 8
Hewett & Sons.....	4,115 19 1	A. J. Cottle..	2,982 13 5
J. T. Jones ..	3,950 3 1	J. H. Simmons	2,886 0 5
H. A. Jones..	3,280 19 2	T. L. Davies, Rhos, Ruabon†..	2,841 11 11
R. Williams..	3,277 9 10		
Tysilio Jones, & Son	3,251 14 0		

ST. ALBANS.—For kerbing and paving footpaths, Fleetville, for Hertfordshire County Council. Mr. Urban A. Smith, County Surveyor, Hatfield:—

J. Dickson....	£364 5 0	E. McEntre ..	£311 17 6
G. W. Mann ..	361 7 6	F. E. Tudor ..	263 7 6
J. Smart & Son	348 0 10	Griffiths & Co.	261 7 6
G. Powdrill ..	336 17 6	H. Williams, Harpenden*..	257 7 6
Wallace & Inns	327 2 6		
H. A. Williamson	317 7 6		

SLIGO.—For the erection of a new wing to the Ursuline Convent. Mr. P. J. Kilgallin, architect, Abbey Villa, Sligo:—

Builder's work only.

D. McLynn	£3,557	C. Connolly	£2,650
J. Clarence.....	2,800	J. Hughes	2,625

STAFFORD.—For 6,800 yds. of sewers, etc., Tillington and Castle Church, for the Stafford Rural District Council. Messrs. R. E. W. Berrington & Son, Engineer, Bank-buildings, Wolverhampton. Quantities by Engineers:—

Castle Church Parish.

C. J. Nevitt, Ltd., Bailey-street, Stafford* .. £4,195 8 6

Tillington Parish.

F. Espley & Sons, Victoria-road, Stafford* .. 3,220 0 0

[Twenty-one tenders were received for both parishes.]

SOUTHSEA.—For girls' secondary school. Southsea. Mr. C. W. Bevis, architect, Elm Grove-chambers, Southsea. Quantities by Mr. C. W. Ball, Whittington-chambers, Southsea:—

J. J. Jerome.	£24,044 13 8	W. R. Light & Son	£21,668 0 0
W. T. Dugan	23,769 0 0	J. Munday ..	21,397 13 9
Armitage & Hodgson ..	22,765 0 0	J. Crockerell.	21,349 0 0
J. Croad	21,875 0 0	W. W. Learmouth	21,100 0 0
F. Corke	21,750 0 0	M. Coltherup	20,700 0 0
S. Salter	21,735 0 0		
F. Privett ..	21,730 0 0		

[Architect's estimate, £21,500.]

SWANSEA.—For erecting a dwelling-house in De-la-Beche-road, Skelty, for Miss Elizabeth Hodge. Mr. C. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—

T. Marles & Sons, Richardson-street-yard, Swansea £495

SWINDON.—For two lodges and entrance gates, etc., at "The Croft," Swindon, for Mr. L. L. Morse, M.P. Messrs. Read & Osborne, architects:—

J. G. Norman	£780	Tydeman Bros.	£590
Spackman Bros.	746	A. J. Colborne*	473
R. J. Leighfield	715		

TATTINGSTONE.—For alterations and repairs at Tattingstone workhouse, for Samford Guardians. Mr. H. J. Wright, architect, 4, Museum-street, Ipswich:—

W. Aldous	£325 0 0	B. Bird, Ipswich*	£265 10 0
A. Upson	321 2 6		
H. J. Lengell ..	273 0 0		

WAMBROOK.—For Wesleyan chapel at Wambrook, near Chard. Mr. E. A. Pryer, architect. Quantities by architect:—

Harris & Woolcott	£530 0	Parsons Bros. & Dunstan	£510 0
Fowler & Stickland	528 10	Bazley & Smith ..	509 0
F. W. Crabb	525 0		

WESTCLIFF-ON-SEA.—For proposed restorations, additions, and alterations, "Doric Lodge," Westcliff-on-Sea, for Mr. Murray. Mr. C. Cooke, architect and surveyor, Southend:—

F. & E. Davey, Ltd.,	£204	J. C. Flaxman†.....	£155
E. Johnson	168		

[All of Southend-on-Sea.]

WORCESTER.—For enlargement of Post Office:—

		Credit.
G. Wells	£5,994 0 0 ..	£81 5
Watts & Co.	3,885 6 6 ..	85 11
J. & A. Brazier	3,116 0 0 ..	25 0
D. Roberts	2,987 0 0 ..	—
Treasure & Son	2,805 0 0 ..	50 0
W. Hopkins	2,700 0 0 ..	15 0
J. Wood & Sons	2,597 0 0 ..	60 0
A. J. Colborne	2,588 0 0 ..	49 0
W. Bowers & Co.	2,505 10 0 ..	36 0
Barnsley & Sons.....	2,446 0 0 ..	80 0
Bromage & Evans*....	1,912 0 0 ..	27 3

J. J. ETRIDGE, Jr.

SLATE MERCHANT,

SLATER & TILER.

Penrhyn-Bangor, Oakeley-Portmadoc,

and every other description of Slates, except American, ready for immediate delivery to any railway station.

Red Sandfaced Nibbed Roofing Tiles always in Stock.

Applications for Prices, etc., to

BETHNAL GREEN SLATE WORKS,
Bethnal Green, London, E.

The BATH STONE FIRMS, Ltd., BATH.

For all the Proved Kinds of

BATH STONE.

FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.

The Ham Hill and Doulting Stone Co., Limited (Incorporating the Ham Hill Stone Co. and C. Trask and Son, The Doulting Stone Co.).

Chief Office:—Norton, Stoke-under-Ham, Somerset.

London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

SPRAGUE & CO., Ltd.,

LITHOGRAPHERS AND PRINTERS.

Estate Plans and Particulars of Sale promptly executed.

4 & 5, East Harding-st., Fetter-lane, E.C.

QUANTITIES, etc., LITHOGRAPHED accurately and with despatch. [Telephone No. 0[illegible] Westminster.

METCHIM & SON { 8, PRINCES STREET, S.W., and 32, CLEMENT'S LANE, E.C.

"QUANTITY SURVEYORS' DIARY & TABLES," For 1906, price 6d., post 7d. In leather, 1/-, post 1/1.

GRICE & CO., STONE MERCHANTS,

ADDISON WHARF, 101, Warwick Rd., KENSINGTON,

FOR ALL THE BEST

Building & Monumental Stone

A LARGE STOCK OF BEST

CAEN Stone { For HOME TRADE and EXPORT,

in Block, Slab, and Scantling.

ASPHALTE

For Horizontal & Vertical Damp Courses.

For Flat Roofs, Basements, & other Floors.

Special attention is given to the above by

THE

French Asphalte Co.

CONTRACTORS TO

H.M. Office of Works, The School Board for London, &c.

For estimates, quotations, and all information apply at the Offices of the Company.

5, LAURENCE POUNTNEY HILL,
CANNON STREET, E.C.

Twelve Gold & Silver Medals Awarded.

IRON CISTERNS.

F. BRABY & CO., LTD.

Very Prompt Supply. Large Stock Ready. Cylinders for Hot-Water Circulation.

PARTICULARS ON APPLICATION.

LONDON: 352 to 364, EUSTON RD., N.W., and 218 and 220, HIGH ST., BOROUGH, S.E.

LIVERPOOL: Havelock Works, Litherland.

GLASGOW: 47 & 49, St. Enoch Square.

BRISTOL: Ashton Gate Works, Coronation Road.